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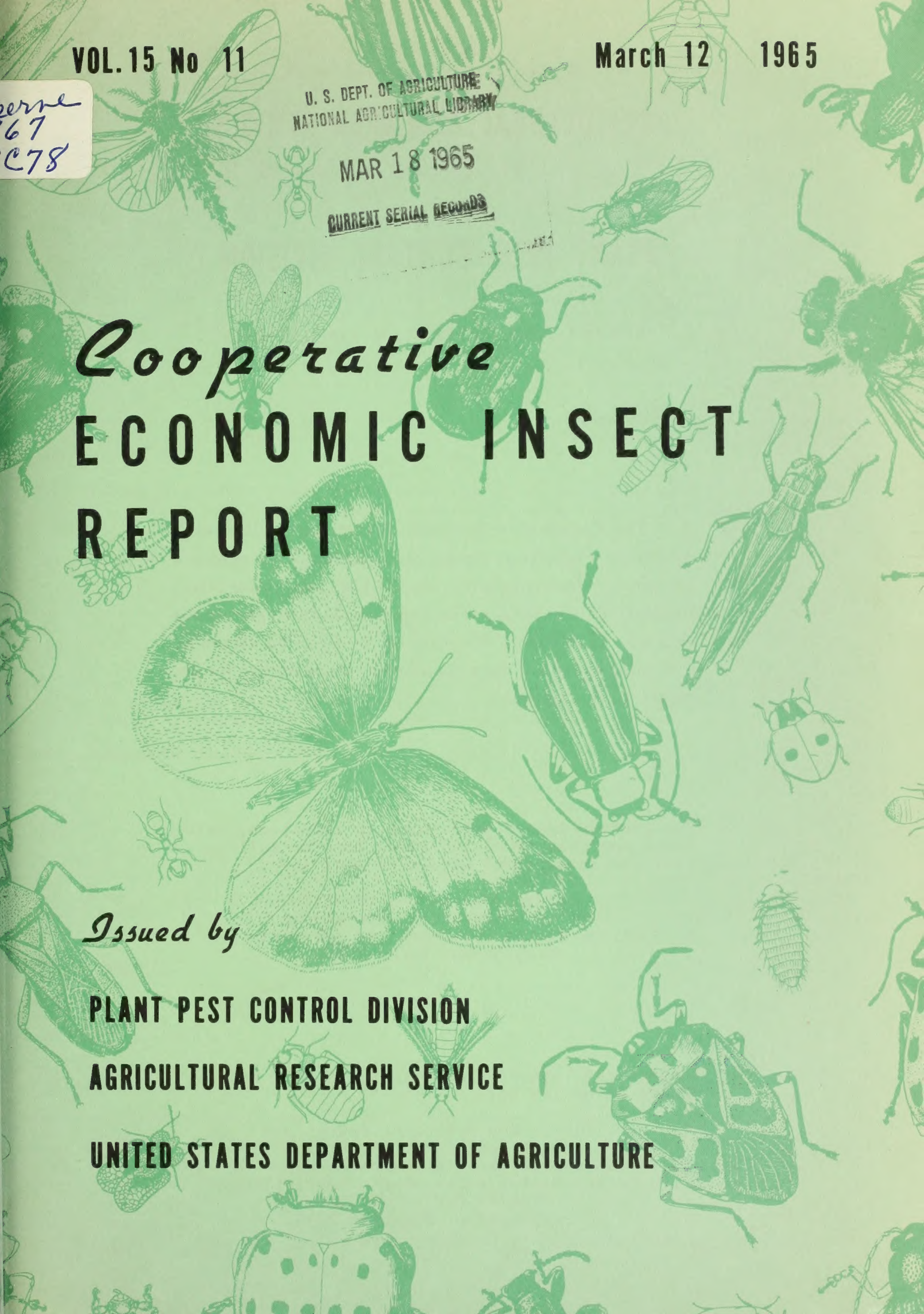

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Cooperative
ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION

AGRICULTURAL RESEARCH SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Volume 15 March 12, 1965 Number 11

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

ALFALFA WEEVIL adults active in Nevada, Utah and North Carolina; hatching underway in Tennessee. Some damage reported in these States. A WEEVIL (*Hypera brunneipennis*) appears to be increasingin alfalfa in areas of Arizona; 70-80 percent of terminals damaged in Yuma County and 50-60 percent of terminals damaged in Maricopa and Pinal Counties. CLOVER LEAF WEEVIL and LESSER CLOVER LEAF WEEVIL active in Nevada. (p. 172).

Small infestation of CALIFORNIA RED SCALE found on citrus near Mesa, Arizona. (p. 172). CITRUS RUST MITE infestations on Florida citrus expected to be above average for March, and GLOVER SCALE and YELLOW SCALE continue more abundant than at any time in 15 years of record. (pp. 172-173). GREEN PEACH APHID egg deposition on peaches heavy in Mesa County, Colorado, and first stem mothers of season noted. (p. 173).

BEET ARMYWORM and GREEN PEACH APHID damaging sugar beet seed crop in Arizona. (p. 173). POPLAR PETIOLE GALL APHID extremely heavy on root systems of turnip in Alabama. (p. 174).

VEGETABLE WEEVIL damaging tobacco in southern Georgia. (p. 174).

Larval infestations of a CONIFER SAWFLY (*Neodiprion taedae linearis*) may be high in Arkansas in spring of 1965, and severe defoliation by FOREST TENT CATERPILLAR expected in northern Minnesota. SPRING CANKERWORM males emerged in Indiana. (p. 176).

HORN FLY active in Alabama. (p. 177). PACIFIC COAST TICK and tick paralysis a problem on livestock in areas of California; wildlife also apparently affected. FACE FLY active in homes in South Dakota. (p. 179).

POTATO TUBERWORM heavy in potato chip factory in Sioux Falls, South Dakota. (p. 180).

DETECTION

A PHYCITID MOTH (*Eumysia mysiella*) reported for first time from California; first host plant also reported. (p. 171). OLEANDER APHID (*Aphis nerii*) and an ARMORED SCALE (*Neopinnaspis harperi*) reported for first time from Hawaii. (p. 182). A GELECHIID MOTH (*Chionodes psiloptera*) reported for first time in Garfield County, Washington. (p. 171).

SPECIAL REPORTS

Status of the Screw-worm in the Southwest. (p. 178).

Hawaiian Insect Notes. (p. 182).

Estimated Losses and Production Costs Attributed to Insects and Related Arthropods Attacking Alfalfa Hay and Clover Hay in Illinois in 1964. (p. 183).

Summary of Insect Conditions in the United States - 1964
- Cereal and Forage Insects (continued)
  - Alfalfa, Clover, Sweetclover and Vetch Insects (p. 184).
  - Soybean and Peanut Insects (p. 197).
  - Lawn, Pasture and Rangeland Insects (p. 200).

Reports in this issue are for week ending March 5 unless otherwise indicated.

WEATHER OF THE WEEK ENDING MARCH 8

The week's weather was dominated by a single low pressure system. Centered near New Orleans, Louisiana, on Monday, the low became stagnant over the Ohio River Valley from Tuesday to Friday and then moved eastward. Circulation around the low caused persistent cloudiness and precipitation throughout the area. In contrast, the western half of the Country was sunny and dry during most of the period.

TEMPERATURE: The persistent low caused unusual temperature patterns as cool air was spread from Arizona to the Carolinas and from Montana and Wyoming to southern Illinois. Most of that area averaged 6° to 12° below normal while the Great Lakes and New England were 6° to 10° above normal for the week. At Caribou, in northern Maine, the weekly average of 38° was 20° above normal, while the average at Little Rock, Arkansas, was also 38° but 11° below normal. Early Friday, it was 28° at Atlanta, Georgia, while it was 41° at Boston, Massachusetts. Freezes occurred from Arizona to Louisiana.

PRECIPITATION: The only precipitation of consequence west of the Rockies fell on the California coast. In Washington and Oregon it was the driest 7-day period since mid-November and may have been the driest Monday through Sunday period in more than a year. The Great Plains received only light precipitation but almost the entire eastern half of the Country received moderate to heavy amounts.

SNOW: Snow early in the week extended into the Deep South with up to 6 inches in central Texas, 4 inches in northern Louisiana and traces of snow in Mississippi. Strong north to northeasterly winds caused much drifting and near-blizzard conditions in northern areas and particularly in southwest Iowa and Minnesota. Snow on March 7 still covered most of the Corn Belt but in the Northeast the snow cover was limited mostly to mountainous areas. Melting snows contributed to local flooding in parts of Iowa, Minnesota and southern Wisconsin. (Summary supplied by U.S. Weather Bureau).

CEREAL AND FORAGE INSECTS

GREENBUG (Schizaphis graminum) - OKLAHOMA - Ranged 5-12 per linear foot in wheat in Tillman County, southwest. (Okla. Coop. Sur.). GEORGIA - Light on small grain in southern area. (Johnson).

APPLE GRAIN APHID (Rhopalosiphum fitchii) - OKLAHOMA - Averaged 50 per linear foot in Tillman County wheat. (Okla. Coop. Sur.).

CORN LEAF APHID (Rhopalosiphum maidis) - ARIZONA - Infestations ranged light to moderate in barley in Maricopa, Pinal, Pima, Cochise and Graham Counties. (Ariz. Coop. Sur.).

APHIDS - NORTH CAROLINA - Unspecified species severely damaged small grain in Fuquay Springs-Varina area of Wake County. Numbers decreased during past week and parasitism by small undetermined wasp noted in all fields. (Robertson).

DESERT CORN FLEA BEETLE (Chaetocnema ectypa) - ARIZONA - Moderate infestations found on small grains, mostly barley, in Maricopa and Pinal Counties. (Ariz. Coop. Sur.).

EUROPEAN CORN BORER (Ostrinia nubilalis) - SOUTH DAKOTA - Recent collections from cornstalks in field in Brookings County indicate population is lower than at same time in 1964. Counts showed 18 larvae per 100 stalks, based on count from 1,800 stalks. Approximately 20-25 percent of larvae had been parasitized by Sympiesis viridula (an ichneumon) and Horogenes punctorius (a eulophid). Indications of disease also present in larvae, but contribution to overall mortality not known. (S.D. Ins. Newsltr.).

CUTWORMS - OKLAHOMA - Unspecified species present in light numbers on wheat in Tillman (southwest) and Washita (west central) Counties. (Okla. Coop. Sur.).

WINTER GRAIN MITE (Penthaleus major) - UTAH - Moderately numerous on grains and alfalfa at North Ogden, Weber County, February 27. Few noted on alfalfa south of Willard, Box Elder County, March 2. (Knowlton).

BROWN WHEAT MITE (Petrobia latens) - UTAH - Light on fall wheat on dryland farm at South Jordan, Salt Lake County. (Knowlton).

A GELECHIID MOTH (Chionodes psiloptera) - WASHINGTON - Larvae damaging blue grass seed fields in Spokane and Garfield Counties. Garfield County is a new county record. (Harwood, Telford).

A PHYCITID MOTH (Eumysia mysiella) - CALIFORNIA - Specimens collected and reared from sagebrush in Kettleman City, Kings County, by F. Surber. This is a new State record and the first record of a host plant. Det. by G. Okumura. (Cal. Coop. Rpt.).

A BILLBUG (Sphenophorus sp.) - NORTH CAROLINA - Damaged roots of sea-oats in experimental plots in Wake County. (Mount).

A LEAFHOPPER (Dikraneura carneola) - UTAH - Active on grassy areas at Perry, Box Elder County, February 27. Moderately numerous on roadside grasses at West Weber, Weber County, March 2. (Knowlton).

A TERMITE - TEXAS - Unspecified species reported from pature grasses in Montague County. (Turney).

DIPTEROUS LARVAE - NORTH CAROLINA - Unspecified species damaged stems of sea-oats in experimental plots in Wake County. (Mount).

ALFALFA WEEVIL (Hypera postica) - SOUTH CAROLINA - Reported active in Anderson and Newberry Counties; damage greatest in Newberry County; probably due to warmer weather and because development has been faster than in upper Piedmont area. (Nettles et al., March 1). TENNESSEE - Hatching underway over much of State. Larval counts presently high in many locations, but larvae quite small. Larvae present where alfalfa has begun to grow. Only few larvae now present in areas east of Knoxville and in plateau region as alfalfa has not begun to grow in these locations. Cold weather killed many larvae in some areas, but many unaffected; more eggs are present to hatch. Control operations will begin much earlier this year, particularly if weather should remain warm. (Mullett). UTAH - Adults active in alfalfa at Granger, Salt Lake County. (Knowlton). NEVADA - Adults active; averaged 3 per square foot in alfalfa in Lovelock, Pershing County, February 26. Active on warmer days during second and third weeks of February in Reno area, Washoe County. (Bechtel).

A WEEVIL (Hypera brunneipennis) - ARIZONA - Populations appear to be increasing in alfalfa in Yuma, Maricopa and Pinal Counties. In Yuma County, 70-80 percent of terminals damaged; in Maricopa and Pinal Counties, 50-60 percent of terminals damaged. (Ariz. Coop. Sur.).

CLOVER LEAF WEEVIL (Hypera punctata) - NEVADA - Adults active on warmer days during second and third weeks of February in Reno area of Washoe County. (Bechtel)

LESSER CLOVER LEAF WEEVIL (Hypera nigrirostris) - NEVADA - Adults active in Reno area, Washoe County, on warmer days during second and third weeks of February. (Bechtel).

PEA APHID (Acyrthosiphon pisum) - ARIZONA - Light to moderate on alfalfa in Yuma County. Moderate infestations prevalent in Maricopa and Pinal Counties; infestations light in Pima, Cochise and Graham Counties. (Ariz. Coop. Sur.). NEW MEXICO - Cold temperatures apparently reduced populations in alfalfa throughout Dona Ana County. (N.M. Coop. Rpt.).

SPOTTED ALFALFA APHID (Therioaphis maculata) - ARIZONA - Light on alfalfa in Yuma, Maricopa, Pinal and Graham Counties. Infestations appear scattered and heavier on old, established stands of alfalfa. (Ariz. Coop. Sur.).

CLOVER LEAFHOPPER (Aceratagallia sanguinolenta) - UTAH - Moderately numerous on alfalfa in Granger area of Salt Lake County. (Knowlton).

FRUIT INSECTS

CALIFORNIA RED SCALE (Aonidiella aurantii) - ARIZONA - Small infestations found in citrus grove near Mesa, Maricopa County. Controls applied. (Ariz. Coop. Sur.).

SAN JOSE SCALE (Aspidiotus perniciosus) - CALIFORNIA - Medium on pear and pyracantha in Los Molinos, on apple in Corning and on quince in Red Bluff, all in Tehama County. (Cal. Coop. Rpt.).

WALNUT SCALE (Aspidiotus juglansregiae) - CALIFORNIA - Medium on walnut trees locally in Lakeside, San Diego County. (Cal. Coop. Rpt.).

Citrus Insect Situation in Florida - End of February - CITRUS RUST MITE (Phyllocoptruta oleivora) infested 61 percent of groves (norm 61 percent); 40 percent economic (norm 37 percent). Population is near normal but further increase is expected to place infestations above average level for March. Highest districts south, west and north. TEXAS CITRUS MITE (Eutetranychus banksi) infested 34 percent of groves (norm 26 percent); 12 percent economic (norm 8 percent). Population is above normal level. Although slight increase expected, few infestations will be important. Highest districts west and central. CITRUS RED MITE (Panonychus citri) infested 31 percent of groves (norm 60 percent); 8 percent economic (norm 32 percent). Little change expected from current low level. Highest districts west and north. SIX-SPOTTED MITE (Eotetranychus sexmaculatus) infested 11 percent of groves (norm 11 percent); 1 percent economic (norm 1 percent). Increase expected and some groves now harboring this mite will develop moderate to heavy infestations. GLOVER SCALE (Lepidosaphes gloverii) infested 95 percent of groves; 35 percent economic. This scale continues more abundant than at any time in 15 years of record. Population will continue near current high level. Highest districts south, central and east. PURPLE SCALE (L. beckii) infested 82 percent of groves (norm 80 percent); 21 percent economic (norm 15 percent). Increase expected, with population moving into high range; however, few infestations will be heavy. Highest districts south and central. CHAFF SCALE (Parlatoria pergandii) infested 74 percent of groves; 32 percent economic. Slight decrease is expected to keep infestations in moderate range. Highest districts east and south. YELLOW SCALE (Aonidiella citrina) infested 68 percent of groves; 21 percent economic. Population continues at highest level in 15 years of record. Slight decrease expected. Highest districts central and south. BLACK SCALE (Saissetia oleae) is decreasing. MEALYBUGS are near seasonal low level. APHIDS will increase in mid-March in scattered groves in warmer areas. WHITEFLIES infested 62 percent of groves (norm 56 percent); 21 percent economic (norm 11 percent). Little change expected from current above average level. (W.A. Simanton (Citrus Expt. Sta., Lake Alfred)).

GREEN PEACH APHID (Myzus persicae) - COLORADO - Egg deposition on peaches in Mesa County heavy (75 percent) on 20 properties compared with light (5 percent) depositions in 1964. First stem mothers noted this year on February 20. (Bulla). ARIZONA - Light to moderate on citrus trees in Mesa-Tempe area of Maricopa County. Also noted on new growth in Yuma County. (Ariz. Coop. Sur.).

A LEAFHOPPER (Cuerna costalis) - FLORIDA - Adults taken on bark of peach at Monticello, Jefferson County. (Hopkins).

LYGUS BUGS (Lygus spp.) - UTAH - Adults, largely L. elisus, active in orchard at North Ogden, Weber County. (Knowlton, Feb. 27).

PEACH TREE BORERS (Sanninoidea spp.) - UTAH - Damaging peach orchard at North Ogden, Weber County. (Knowlton).

TRUCK CROP INSECTS

BEET ARMYWORM (Spodoptera exigua) - ARIZONA - Moderate populations continue to damage sugar beet seed crop in Maricopa and Yuma Counties. (Ariz. Coop. Sur.).

A NOCTUID MOTH (Proxenus mindara) - CALIFORNIA - Medium numbers of larvae and pupae noted on sugar beets in Crows Landing, Stanislaus County. (Cal. Coop. Rpt.).

A LEAF ROLLER MOTH (Platynota stultana) - CALIFORNIA - Larvae appearing on sugar beet plantings in Fresno County. Some damage noted. (Cal. Coop. Rpt.).

GREEN PEACH APHID (Myzus persicae) - ARIZONA - Moderate to heavy populations damaging sugar beets grown for seed in Maricopa and Yuma Counties. Light to moderate on lettuce and cabbage in Maricopa County. (Ariz. Coop. Sur.).

BEET LEAFHOPPER (Circulifer tenellus) - CALIFORNIA - Spraying in Imperial Valley began February 10 and terminated February 17. Total of 4,780 acres of desert annuals, principally Plantago spp. (plantain) in Dixieland area, treated in Imperial County. (Cal. Coop. Rpt.).

DARKLING BEETLES (Blapstinus spp.) - ARIZONA - Damaging cantaloups in fields with heavy, old crop residues in Yuma County. (Ariz. Coop. Sur.).

POPLAR PETIOLE GALL APHID (Pemphigus populitransversus) - ALABAMA - Extremely heavy numbers feeding on root systems of turnips in several Henry County gardens. Populations so heavy in some gardens that aphids followed feeder roots out and away from taproot 2-6 inches and emerged in small clumps on surface of wet soils. (Kimbrough et al.).

CABBAGE APHID (Brevicoryne brassicae) - GEORGIA - Light on commercial cabbage in southern area. (Johnson).

VEGETABLE WEEVIL (Listroderes costirostris obliquus) - TEXAS - Larvae damaging mustard in Tyler County. (Hamman).

SPOTTED CUCUMBER BEETLE (Diabrotica undecimpunctata howardi) - ALABAMA - Few adults in hibernation taken from surface trash near cotton fields. (McQueen).

A LEAF BEETLE (Phaedon sp.) - FLORIDA - Severe on turnip at Ocala, Marion County. (Roberson, Feb. 23).

MEXICAN BEAN BEETLE (Epilachna varivestis) - ALABAMA - Average of one adult per farm recovered from trash smaples in Henry County. This at relative rate of approximately 800 adults per acre of trash and in areas not adjacent to gardens or soybeans where counts should be much higher. Trash collected during boll weevil (Anthonomus grandis) survival survey. (Kimbrough, West, et al.).

SPIDER MITES - ARKANSAS - Unspecified species very heavy on tomato plant bed in Conway County. (Ark. Ins. Sur.).

VARIEGATED CUTWORM (Peridroma saucia) - CALIFORNIA - Heavy on strawberry plants in Salida, Stanislaus County. (Cal. Coop. Rpt.).

THRIPS - NEW MEXICO - Populations on truck crops lighter than during past 3 weeks. (N.M. Coop. Rpt.).

TOBACCO INSECTS

VEGETABLE WEEVIL (Listroderes costirostris obliquus) - GEORGIA - Light to moderate feeding damage noted on tobacco plants in southern area. (Johnson).

TOBACCO FLEA BEETLE (Epitrix hirtipennis) - GEORGIA - Light on tobacco in southern area. (Johnson).

COTTON INSECTS

PINK BOLLWORM (Pectinophora gossypiella) - FLORIDA - Larvae taken on wild cotton (Gossypium hirsutum) at 2 locations in Cape Sable area, Monroe County, (Weaver, Feb. 11), and collected at Palm Key (Flamingo), Monroe County, (Humphries, Feb. 20).

A COSMOPTERIGID MOTH (Sathrobrota sp.) - FLORIDA - Larvae taken on wild cotton (Gossypium hirsutum) at Cape Sable and at Murray Key, Dade County, (Weaver, Humphries, Feb. 11 and 18). Lightly infested cotton at Bradenton, Manatee County, (Stees, Wachtel, Feb. 23).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

SOUTHERN PINE BEETLE (Dendroctonus frontalis) - ALABAMA - Controls continued at reduced level on Shoal Creek and Talladega Districts of National Forests. Control terminated on Tuscaloosa and Oakmulgee Districts; infestations now considered endemic. Epidemic infestations observed on private lands west of Birmingham during fall of 1964. Some salvage being done by companies in infested area. GEORGIA - Populations decreased on Tallulah District, Chattahoochee National Forest, due to control efforts and cooler temperatures. In January, epidemic discovered in northwest Hall County; this same county in which epidemic first observed in 1962-1963. Survey showed 4,600 infested trees supporting an 11:1 population increase; represents 53 infested trees per 1,000 acres. Plans underway for removal of all infested trees before spring emergence. LOUISIANA - Activity confined to West Bay area of Allen Parish; continues relatively low. October evaluation showed slight decrease in number of infested trees since July survey. Additional infestations found during fall and winter of 1964, particularly in upper portions of trees previously attacked by D. terebrans (black turpentine beetle). MISSISSIPPI - Activity continues on Homochitto National Forest. Number of infested trees per 1,000 acres declined from 20 in September to slightly more than 3 in December. NORTH CAROLINA - Infestations detected in Washington and Beaufort Counties on Coastal Plain. Most activity confined to pond pine in poorly drained areas. Serious outbreak active on 3,500-acre estate in northern Granville County; estimated 30 percent of shortleaf pine destroyed. Activity continues at high level in upper Piedmont counties. Salvage operations saving merchantable values and reducing beetle populations. Infestations detected on 2 red pine plantations in Macon County. SOUTH CAROLINA - Infestations continued on Francis Marion National Forest during late summer and early fall at slightly lower level than during summer. Salvage and control minimizing losses. Beetle activity on Tyger and Enoree Districts of Sumter National Forest declined suddenly after late summer buildup. Infestation level declined to 2.1 infested trees per 1,000 acres on Tyger District in September to unmeasurable level in January. Beetle populations exploded to high level of 39 infested trees per 1,000 acres on Andrew Pickens District of Sumter National Forest during period September 1964-January 1965. Chemical control and salvage in progress. TENNESSEE - Infestation detected over portions of Roane, Anderson, Knox and Loudon Counties; centered along Clinch River, south of Oak Ridge. Spots containing up to 1,000 red-topped and fading pines detected during January. TEXAS - Activity in southeast at low level at end of 1964. No new infestations reported in December. Results of January survey showed infested trees per 1,000 acres increased from 1.2 in September to 2.0. This is first time winter survey has shown increase in beetle activity since evaluation surveys were started in 1962. (South. For. Pest Rptr., Feb.).

BLACK TURPENTINE BEETLE (Dendroctonus terebrans) - ARKANSAS - Beetle activity leveled off at end of 1964; however, local infestations continue active. TEXAS - Beetle attacks remained constant during December on the National Forests, northern Jasper, southeastern Houston and Trinity Counties. (South. For. Pest Rptr., Feb.).

ENGRAVER BEETLES (Ips spp.) - ARKANSAS - Few local infestations continue active; however, infestations generally leveled off. NORTH CAROLINA - Approximately 200 Virginia pines killed in old field near Weaverville, Buncombe County, by I. pini (pine engraver) and I. grandicollis. Infestation of I. pini detected near Busick, Yancey County, in white pine infected with annosus root rot (Fomes annosus). GEORGIA - Heavy infestation of I. avulsus occurred in red pine infested with D. frontalis (southern pine beetle) in Macon County. Activity of Ips spp. about normal for this time of year in remainder of region (Georgia, Alabama and Florida). (South. For. Pest Rptr., Feb.).

PALES WEEVIL (Hylobius pales) - NORTH CAROLINA - Active in vicinity of Wilmington, New Hanover County, throughout winter and attacked loblolly pine seedlings in mid-January that had been planted less than a month. (South. For. Pest Rptr., Feb.).

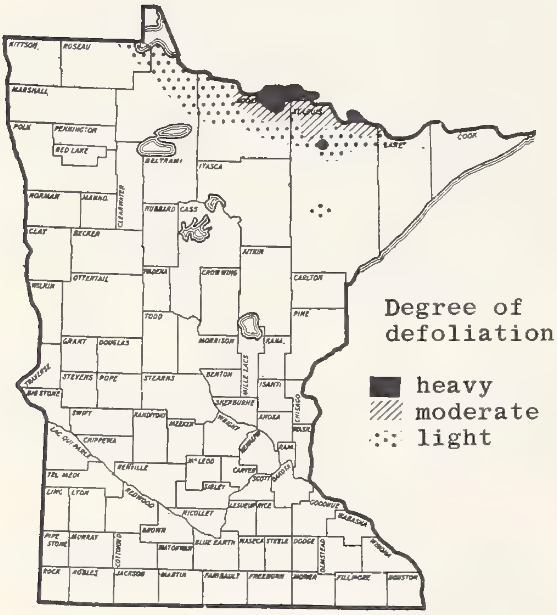
BALSAM WOOLLY APHID (Chermes piceae) - Surveys of native spruce-fir type in NORTH CAROLINA and TENNESSEE to detect infestations are complete. Five areas of infestation found: 3 in new locations and 2 in areas near where infestations occurred previously. New locations: Haw Orchard Ridge on Roan Mountain, a new center on Grandfather Mountain and an area near Cataloochee Knob in Great Smoky Mountains National Park. Infestations detected adjacent to known infestations included several groups of infested trees on Feeding Ridge north of Mount Sterling in Great Smoky Mountains National Park. Infestation also detected in 2-acre Fraser fir plantation near Blowing Rock, North Carolina. (South. For. Pest Rptr., Feb.).

NANTUCKET PINE TIP MOTH (Rhyacionia frustrana) - OKLAHOMA - Emergence of adults 90 percent complete in one pine plantation in Payne County. (Okla. Coop. Sur.).

CONIFER SAWFLIES (Neodiprion spp.) - ARKANSAS - Emergence of N. taedae linearis heavy in northwest. Survival of material collected in southern area also good. Weather has been favorable for oviposition, and larval infestations in spring of 1965 may be high. NORTH CAROLINA - Localized defoliation by N. lecontei (red-headed pine sawfly) occurred at the Beech Creek seed orchard of National Forests. (South. For. Pest Rptr., Feb.).

TENT CATERPILLARS (Malacosoma spp.) - MINNESOTA - M. disstria (forest tent caterpillar) egg mass survey conducted in central, north central and northeastern districts during fall and winter of 1964-1965. Total of 197 plots examined, using 3 aspen trees per plot. Approximately 3,400,000 acres found infested along northern border of State. Approximately 300,000 acres classed as a heavy infestation, with severe defoliation expected in 1965. Of remaining area, 900,000 acres classed as moderate and 2,200,000 acres classed as lightly infested. (Minn. Ins. Rpt.). See accompanying map. TEXAS - Surveys for egg masses of M. disstria and M. tigris on oaks conducted in Travis, Hays, Comal, Kendall, Blanco, Burnet, Lampasas, Hamilton and Coryell Counties. Results indicate potentially damaging numbers present. Counts ranged from light (1-4 egg masses per tree) to heavy (10-15 egg masses per tree). (Meisch).

Forest Tent Caterpillar
Predicted Defoliation - 1965



SPRING CANKERWORM (Paleacrita vernata) - INDIANA - Adult males emerged from beneath silver maple at West Lafayette, Tippecanoe County, February 28. (Chandler).

ELM LEAF BEETLE (Galerucella xanthomelaena) NEW MEXICO - Adults, probably this species, hibernating in and around buildings in north Albuquerque, Bernalillo County. (N.M. Coop. Rpt.).

CABBAGE LOOPER (Trichoplusia ni) - FLORIDA - Larvae light on leaves of chrysanthemum (iceberg variety) at Punta Gorda, Charlotte County. (Walsh, Nelson, Feb. 22).

A JUNIPER TWIG MOTH (Periploca nigra) - CALIFORNIA - Medium and damaging on juniper in Santa Rosa, Sonoma County. (Cal. Coop. Rpt.).

A PLUME MOTH (Platyptilia pica monticola) - CALIFORNIA - Light on geranium plants in nursery at Bonsall, San Diego County. (Cal. Coop. Rpt.).

RUSTY PLUM APHID (Hysteroneura setariae) - ARIZONA - Heavy populations damaging ornamentals in Phoenix, Maricopa County, area. (Ariz. Coop. Sur.).

APHIDS - NEW MEXICO - Cinara tujafilina moderate to heavy on arborvitae in Dona Ana, Sierra and Bernalillo Counties. (N.M. Coop. Rpt.). CALIFORNIA - Probably C. tujafilina medium locally on cypress, and Amphorophora nervata medium on arbutus in Fresno, Fresno County. (Cal. Coop. Rpt.).

COCCIDS - MARYLAND - Lecanium nigrofasciatum (terrapin scale) infesting red maple at University Park, Prince Georges County. (U. Md., Ent. Dept.). FLORIDA - Ceroplastes cirripediformis (barnacle scale) and Aspidiotus lataniae taken on rattanvine at East Palatka, Putnam County. (Graham, Feb. 24, Mar. 5). Howardia biclavis (mining scale) taken on yaupon at Plant City, Hillsborough County. (Bingaman, Custead, Feb. 22). Pseudococcus citri (citrus mealybug) taken on Phyllanthus caroliniensis at Bartow, Polk County, and Phenacoccus solani taken on Chenopodium botrys at Clermont, Lake County. (Anderson, Feb. 17, 24). All stages of Pinnaspis aspidistrae (fern scale) taken on hopseedbush at Hobe Sound, Baker County. (Campbell, Smith, Feb. 27). These are new host records for Florida Division of Plant Industry. (Fla. Coop. Sur.). All stages of Protopulvinaria pyriformis (pyriform scale) severe on leaves of 11 variegated ivy plants in nursery at Clermont, Lake County. (Fatic, Feb. 24). All stages of Pseudaulacaspis major severe on stem of goldenrain-tree in nursery at Miami, Dade County. (Herrmann, Feb. 15). P. pentagona (white peach scale) severe on stems of 15 allamanda plants in nursery at Bradenton, Manatee County. (Bickner, Feb. 18). ALABAMA - Extremely heavy populations of Fiorinia theae (tea scale) continue to damage isolated camellia plantings in Henry County. Aspidiotus perniciosus (San Jose scale) extremely heavy and damaging pyracanthas at a municipal building at Guntersville, Marshall County. (McQueen). NEW MEXICO - Unaspis euonymi (euonymus scale) light to heavy and damaging euonymus in Albuquerque area, Bernalillo County. (N.M. Coop. Rpt.). COLORADO - Phenacaspis pinifoliae (pine needle scale) heavy on blue spruce and pine along municipal parkways in Colorado Springs area, El Paso County. (Hantsbarger). CALIFORNIA - Spilococcus cactearum heavy on cactus nursery stock in San Diego, San Diego County. Parlatoria oleae (olive scale) medium on Oregon-grape shrubs in Willows, Glenn County. P. pittospori adults heavy on Cedrus sp. nursery stock, native holly and dracaena in La Mesa, San Diego County. Diaspis boisduvalii heavy on cattleya orchids in nursery in Lindsay, Tulare County. P. pinifoliae medium on pine trees in El Cajon, San Diego County. (Cal. Coop. Rpt.).

GREENHOUSE WHITEFLY (Trialeurodes vaporariorum) - CALIFORNIA - Medium on pyracantha nursery stock in Grover City, San Luis Obispo County, medium on eucalyptus nursery stock in Los Altos, Santa Clara County, and medium on avocado in Fresno, Fresno County. (Cal. Coop. Rpt.).

SPIDER MITES - CALIFORNIA - Oligonychus coniferarum nymphs and adults heavy on arborvitae nursery stock in Westminster, and O. subnudus medium on Monterey pine in Anaheim, Orange County. (Cal. Coop. Rpt.).

INSECTS AFFECTING MAN AND ANIMALS

CATTLE GRUBS (Hypoderma spp.) - COLORADO - H. lineatum (common cattle grub) averaged 10 per head on untreated cattle in Cheyenne County and 20 per head on untreated cattle in Las Animas County. (Hantsbarger). UTAH - Infestations of Hypoderma spp. have been moderate in most Uintah County herds this winter. (Bendixsen, Knowlton). Control program on beef and dairy cattle underway in Cache County. Infestations light to March 2. Dairy cattle treated as need arises. Approximately 50 percent of dairy cattle and 60 percent of beef animals will be treated. (Tueller, Knowlton). OKLAHOMA - H. lineatum averaged one larva per head on steers in Payne County (north central); maximum count was 4 per head. Numbers moderate on cattle in Bryan County (south central) and light in Mayes County (northeast). Few adults active in Payne County (north central). (Okla. Coop. Sur.).

HORN FLY (Haematobia irritans) - ALABAMA - Counts ranged 2-5 on numerous beef cattle in one Henry County herd. (Kimbrough et al.).

STATUS OF THE SCREW-WORM (*Cochliomyia hominivorax*) IN THE SOUTHWEST

No infestations have been reported in the Southwestern Eradication Area or the State of Arizona since the last case in Live Oak County, Texas, in late January. The Republic of Mexico, however, continues to report a number of cases. During the week February 28 - March 6 these totaled 23; Sonora 15, Durango 1, and Tamaulipas 7. Total sterile flies released: 2,086,250 in Texas, and 61,688,000 in Mexico.

	Positive Cases		Negative Cases		Ratio of Positive Cases to 100 Cases Negative	
Year	Current	Cumulative	Current	Cumulative	Current	Cumulative
Table 1.	Comparison of specimens reported during corresponding weeks in 1963 and 1964 in Southwestern Eradication Area.					
1963	10	144	40	197	25.00	73.09
1964	0	0	43	283	0.00	0.00
1965	0	4	35	437	0.00	0.91
Table 2.	Comparison of specimens reported during corresponding weeks and in a corresponding area in 1964 in the United States-Mexico Barrier Zone.*					
1964	2	129	34	122	5.88	105.73
1965	22	395	13	250	169.23	158.00
Table 2A.	Mexican portion of Barrier Zone only.					
1964	1	125	5	44	20.00	284.09
1965	22	393	8	154	275.00	255.19

* Barrier Zone - Area in which screw-worm eradication operations are being carried out in an effort to prevent establishment of self-sustaining screw-worm population in the United States. (Anim. Dis. Erad. Div.).

HOUSE FLY (*Musca domestica*) - GEORGIA - Unusually heavy numbers emerging from droppings of caged layers in Telfair County. (Johnson).

BLOW FLIES - UTAH - Moderately numerous about corral at Willard, Box Elder County; common in Logan-Wellsville area of Cache County and at Slaterville in Weber County. (Knowlton).

CATTLE LICE - UTAH - Unspecified species moderately numerous in many beef herds in Uintah County. (Bendixsen, Knowlton). OKLAHOMA - *Bovicola bovis* (cattle biting louse) heavy on cattle in Kay County (north central). *Haematopinus eurysternus* (short-nosed cattle louse) present on steers in Payne County (north central). Unspecified species heavy on cattle in Pushmataha and Choctaw Counties (southeast) and Bryan County (south central), and light in Mayes County (northeast). (Okla. Coop. Sur.). ARKANSAS - Infestations of various species lighter than normal; light on most herds checked in northwest area. Heavy infestations noted only on an occasional herd. (Ark. Ins. Sur.). NORTH CAROLINA - Unspecified species of sucking lice severe on one calf and heavy on another calf randomly chosen from beef herd in Johnston County pasture. Light numbers of *B. bovis* also present. (Mount).

HOG LOUSE (*Haematopinus suis*) - OKLAHOMA - Heavy on hogs in Bryan County (south central). (Okla. Coop. Sur.).

BED BUG (Cimex lectularius) - NEVADA - Extremely heavy in home in Reno, Washoe County, in January. (Ting).

PACIFIC COAST TICK (Dermacentor occidentalis) - CALIFORNIA - Infestations have occurred in Calaveras, Ventura, Placer and El Dorado Counties. Horses, ponies, beef cattle and dry dairy cows affected by paralysis; 4 cows died in Calaveras County and 17 paralyzed and one dead in Ventura County. Ticks ranged 24 to 54 or more on infested animals. Rapid recovery resulted from removal of ticks. Several deer carcasses reported from El Dorado and Fresno Counties. Presence of ticks on these animals indicates wildlife also affected. (E. Loomis).

LONE STAR TICK (Amblyomma americanum) - OKLAHOMA - Numbers light on cattle in Pushmataha County (southeast), as most have fed and dropped off. (Okla. Coop. Sur.).

BROWN DOG TICK (Rhipicephalus sanguineus) - DELAWARE - Infestations in homes throughout winter have been very numerous. (Burbutis).

A TICK (Dermacentor sp.) - NEVADA - Troublesome in Reno area, Washoe County. (Lauderdale).

VESPID WASPS (Vespa spp.) - UTAH - Active at Odgen, Weber County. (Knowlton).

HOUSEHOLD AND STRUCTURAL INSECTS

FACE FLY (Musca autumnalis) - SOUTH DAKOTA - Reported active in some homes. (S.D. Ins. Newsltr.).

CLUSTER FLY (Pollenia rudis) - UTAH - Numerous at Slaterville, Weber County, and on sunny wall of home at Logan, Cache County. (Knowlton).

ELM LEAF BEETLE (Galerucella xanthomelaena) - MARYLAND - Adults found in attic of home in Emmitsburg, Frederick County. (U. Md., Ent. Dept., Feb. 22).

SAW-TOOTHED GRAIN BEETLE (Oryzaephilus surinamensis) - DELAWARE - Several infestations occurred in New Castle County homes during past 2 weeks. (Burbutis).

SUBTERRANEAN TERMITES (Reticulitermes spp.) - DELAWARE - First swarm of R. flavipes (eastern subterranean termite) noted in New Castle County. (Burbutis). MARYLAND - Reticulitermes spp. winged forms swarmed on properties in Howard and Montgomery Counties. (U. Md., Ent. Dept.). NEW MEXICO - Large numbers of winged forms noted near shopping center in Albuquerque, Bernalillo County. (N.M. Coop. Rpt.). NEVADA - Several infestations of Reticulitermes spp. reported in houses in Reno, Washoe County. (Coop. Rpt.).

CARPENTER ANTS (Camponotus spp.) - TEXAS - Light local infestations causing concern to residents of Milam County. (Moore). OKLAHOMA - C. caryae a problem in home in Payne County. (Okla. Coop. Sur.).

BOXELDER BUG (Leptocoris trivittatus) - UTAH - Infesting several homes in Salt Lake City-Holladay area, Salt Lake County. (Knowlton).

CLOVER MITE (Bryobia praetiosa) - ARIZONA - Migrating into homes in Phoenix area, Maricopa County. (Ariz. Coop. Sur.). UTAH - Becoming numerous about some homes at Brigham City, Box Elder County, (Feb. 27); and entering a few homes in Ogden, Weber County, area. (Knowlton).

BENEFICIAL INSECTS

A LADY BEETLE (Coleomegilla maculata fuscilabris) - ALABAMA - Fifty specimens taken from 5 of 30 woods trash samples collected in Henry County. (McQueen).

A BIG-EYED BUG (Geocoris punctipes) - ALABAMA - About 100 specimens collected from 30 woods trash samples collected in Henry County. (McQueen).

STORED-PRODUCT INSECTS

Stored-grain Insects in Florida - Tribolium castaneum (red flour beetle), Oryzaephilus surinamensis (saw-toothed grain beetle) and Sitophilus oryzae (rice weevil) heavy in stored grain at feed company in Ocala, Marion County. (Roberson, Feb. 23).

POTATO TUBERWORM (Gnorimoschema operculellum) - SOUTH DAKOTA - Heavy infestation observed in potato chip factory in Sioux Falls, Minnehaha County. Large numbers of moths noted in conditioning room and numerous potatoes contained developing larvae. (S.D. Ins. Newsltr.). MARYLAND - Moderately injured stored potatoes on property in Anne Arundel County. (U. Md., Ent. Dept.).

MISCELLANEOUS INSECTS

A MARCH FLY (Dilophus orbatus) - CALIFORNIA - Larvae heavy locally in soil in Escondido, San Diego County. (Cal. Coop. Rpt.).

CITRUS WHITEFLY (Dialeurodes citri) - CALIFORNIA - An additional 64 blocks in city of Sacramento sprayed. More than two-thirds of treatment area now covered. Post-spray inspections have not revealed any live whiteflies. No evidence of spread found by grid inspection on periphery of infested area. At Fresno, Fresno County, preliminary inspection within one-half mile radius of 38-block infested area revealed no extension; outbreak may be relatively restricted. Treatment to begin soon. (Cal. Coop. Rpt.).

MOURNING-CLOAK BUTTERFLY (Nymphalis antiopa) - UTAH - Emerged at Logan, Cache County, and Salt Lake City, Salt Lake County. (Knowlton).

LIGHT TRAP COLLECTIONS

	Tempera-ture °F.	Precip-itation (inches)	Type of trap *	Agrotis ipsilon (black cutworm)	Carpocapsa pomonella (codling moth)	Chorizagrotis auxiliaris (army cutworm)	Estigmene acrea (salt-marsh caterpillar)	Faronta diffusa (wheat head armyworm)	Feltia subterranea (granulate cutworm)	Heliothis virescens (tobacco budworm)	H. zea (bollworm, corn earworm, tomato fruitworm)	Loxostege commixtalis (alfalfa webworm)	Loxostege similalis (garden webworm)	Loxostege sticticalis (beet webworm)	Ostrinia nubilalis (European corn borer)	Peridroma saucia (variegated cutworm)	Prodenia ornithogalli (yellow-striped armyworm)	Protoparce quinquemaculata (tomato hornworm)	Protoparce sexta (tomato hornworm)	Pseudaletia unipuncta (armyworm)	Spodoptera exigua (beet armyworm)	Spodoptera frugiperda (fall armyworm)	Trichoplusia ni (cabbage looper)	Crops **
FLORIDA																								
Gainesville 3/1			BL						3											4				
GEORGIA																								
Tifton 2/18-24	33-66	1.05	BL							0	0							0	0					
Tifton 2/25-3/3	26-65	2.45	BL							0	0							0	0					
SOUTH CAROLINA																								
Charleston 3/1-7	32-74	3.02	BL	6			0		4	0	0					0	0	0	0	11		0	0	
TEXAS																								
Brownsville 2/23-28	38-79	Trace	5 BL	195			7		234	1	81					50	2	3	3	259		136	49	
Waco 2/27-3/5			BL	0			0		6	0	1					13	30			9	0	0	0	

* BL = blacklight; I incandescent; MV = mercury vapor; O = other

** alf. = alfalfa; beet = garden beet and/or sugar beet; cole = cole crops (crucifers); cott. = cotton; FC = field corn; grain = small grains; leg. legumes (unspecified); lett. = lettuce; pean. = peanut; pepp. = pepper; pot. = potatoes; SC = sweet corn; sol. = solanaceous plants (unspecified); soy. = soybean; TC = truck crops (unspecified or mixed); tob. = tobacco; tom. = tomato.

HAWAIIAN INSECT NOTES

The following notes on Hawaii insect conditions were presented at the 709th and 710th meetings of the Hawaiian Entomological Society held in January and February 1965, respectively.

A SCOLYTID BEETLE (*Hypothenemus pubescens* Hopkins) was recovered from Bermuda grass at a residence on the Kona coast of the island of Hawaii on December 16, 1964, by C. Gaddis. This is a new island record for this species. This beetle was first reported in the State from Maui and Molokai during November 1964 and from Oahu on December 7, 1964. (H. Nakao, Jan. Meeting).

A single female of SOUTHERN HOUSE MOSQUITO (*Culex pipiens quinquefasciatus* Say) was collected at 6,300 feet on Haleakala Crater at Paliku, Maui, on January 30. Specimen taken sweeping vegetation in wet portion of crater. Specimen of this mosquito also collected by sweeping at Keanakolu, Hawaii, at elevation of 5,200 feet during October 1964. It is not known whether southern house mosquito is actually breeding at these elevations, but adults of *Culex* spp. have been collected at Kilauea, Hawaii, for many years. (D. E. Hardy).

OLEANDER APHID (*Aphis nerii* Fonsc.) found heavily infesting leaves and shoots of oleander (*Nerium oleander*) bushes about transformer installation at Campbell Industrial Park, Barbers Point, Oahu, February 3. This is the first record of this aphid in Hawaii. The known hosts include oleander, various species of Asclepiadaceae (milkweeds, crownflower, etc.), *Convolvulus* spp. and *Solanum* spp. Oleander aphid colonies found at Barbers Point were heavily parasitized by a BRACONID WASP (*Lysiphlebus testaceipes* (Cresson)). The mumified aphids were dark red in color. Numerous adults and larvae of a COCCINELLID BEETLE (*Coelophora inaequalis* (F.)) were also present, preying upon oleander aphid. (J. W. Beardsley, W. C. Mitchell, Ganesalingham).

An ARMORED SCALE (*Neopinnaspis harperi* McKenzie) collected on Puu Kohahuanui Trail, Oahu, at an elevation of 2,500 feet on September 1, 1953, is a new record for the State. This bark infesting armored scale was collected on bark of *Gouldia terminalis* by Mrs. Marion (Adachi) Kohn. (J. W. Beardsley).

SOUTHERN GREEN STINK BUG (*Nezara viridula* L.) damaged Chinese cabbage during September 1964 at the Laumilo Experimental Farm, Kamuela, Hawaii, at an elevation of 2,650 feet. This is the highest elevation at which this pest has been recorded in the State. (W. C. Mitchell, F. McEven, Y. Takushi).

A CARPENTER ANT (*Camponotus maculatus* (F.)) was reported to be making nests in rolls of "tape coat", an asphaltum coated fabric used in making splices in lead-sheathed coaxial cables. Investigation showed that nest material was not "tape coat", but a similar material, the source of which was unknown. Considerable damage from SUBTERRANEAN TERMITES eating through the jacket of polyethylene cables was also reported; this allowed water to enter the cable and short out circuits. (W. C. Mitchell, M. V. King).

A FLAT BUG (*Mezira membranacea* (F.)) was collected from bark of Ohia trees on December 29, 1964, at Kapoho, Hawaii. This is the first record of this aradid bug from the island of Hawaii. (W. C. Mitchell, G. Santo).

ESTIMATED LOSSES AND PRODUCTION COSTS ATTRIBUTED TO INSECTS AND RELATED ARTHROPODS

IN Illinois (State or District) DURING 1964 (Year)

ATTACKING Alfalfa Hay (Commodity or Crop)

A. Pest or pest complex: Potato leafhopper

B.	Number of acres[a] produced (From CRS)[d]	No.	1,117,000
C.	Average yield per acre[a] (From CRS)	Units/	1.3 tons
D.	Price[b] per unit (ton)[c] (From CRS)	$/	23.00
E.	Acres[a] needing control	No.	33,175
F.	Acres[a] treated	No.	25,650
G.	Reduction due to not treating where needed:		
	H. Loss in yield, percent	%	6
	I. Loss in yield, units per acre[a], C x H	Units/	0.08 ton
	J. Loss in yield, $ per acre[a], D x I	$/	1.84
	K. Loss in quality, $ per acre[a]	$/	5.75
L.	Yield loss for all acres[a], (E-F) x I	Units	6.02 tons
M.	Control cost, $ per acre[a],	$/	3.25
N.	Control cost for all acres[a], F x M	$	83,362
O.	Yield loss for all acres[a], (E-F) x J	$	13,846
P.	Quality loss for all acres[a], (E-F) x K	$	43,269
Q.	Combined control cost and losses, N + O + P	$	140,477

R. Percent loss due to each insect in the complex:

Comment:

a. Acres, head of cattle or other producing units used by Crop Reporting Service.

b. Season average price per unit as given by CRS (describe basis).

c. Bushels, boxes, tons or other marketing units used by CRS; show which in ( ).

d. Illinois Annual Crop Summary, Dec. 22, 1964

Submitted by Clarence E. White

Date January 28, 1965

ATTACKING Clover Hay (Commodity or Crop)

A. Pest or pest complex: Clover leaf weevil

B.	Number of acres[a] produced (From CRS)[d]	No.	648,000
C.	Average yield per acre[a] (From CRS)	Units/	1.07 tons
D.	Price[b] per unit (ton)[c] (From CRS)	$/	23.00
E.	Acres[a] needing control	No.	101,412
F.	Acres[a] treated	No.	11,224
G.	Reduction due to not treating where needed:		
	H. Loss in yield, percent	%	15
	I. Loss in yield, units per acre[a], C x H	Units/	0.16 ton
	J. Loss in yield, $ per acre[a], D x I	$/	3.68
	K. Loss in quality, $ per ----[a]	$/	----
L.	Yield loss for all acres[a], (E-F) x I	Units	14,430 tons
M.	Control cost, $ per acre[a],	$/	3.25
N.	Control cost for all acres[a], F x M	$	36,478
O.	Yield loss for all acres[a], (E-F) x J	$	331,892
P.	Quality loss for all ----[a], (E-F) x K	$	----
Q.	Combined control cost and losses, N + O + P	$	368,370

R. Percent loss due to each insect in the complex:

Comment:

a. Acres, head of cattle or other producing units used by Crop Reporting Service.

b. Season average price per unit as given by CRS (describe basis).

c. Bushels, boxes, tons or other marketing units used by CRS; show which in ( ).

d. Illinois Annual Crop Summary, Dec. 22, 1964.

Submitted by Clarence E. White

Date January 28, 1965

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES - 1964

(continued from page 168)

CEREAL AND FORAGE INSECTS (continued)

ALFALFA, CLOVER, SWEETCLOVER AND VETCH INSECTS

Highlights:

ALFALFA WEEVIL was the most important pest species of alfalfa during the 1964 season. It was reported from Indiana, Illinois, Missouri and Louisiana for the first time this year, as well as from 89 new counties in 12 States. Damage by this weevil ranged from light to severe throughout the Nation, with more damage than usual being reported from several areas. Removal of certain chlorinated hydrocarbons with long residuals from spray programs will pose problems in finding effective controls for this pest. Populations of alfalfa weevil in the spring of 1965 are expected to be high in Delaware, North Carolina and some other sections. In Georgia and Alabama, alfalfa weevil has caused considerable reduction in the planting of alfalfa and planning by growers for additional acreages. CLOVER HEAD WEEVIL populations were high and losses were severe in all white clover producing areas of Louisiana, and VETCH BRUCHID was widespread and heavy in vetch-producing areas of Texas. PEA APHID was heavy on legumes in north central and central Texas and locally heavy on alfalfa in eastern Kansas. Infestations in Nevada and Wyoming were above 1963 levels. SPOTTED ALFALFA APHID populations were heavier in Nevada than in 1963, and caused severe damage in areas of Kansas. This aphid was found for the first time in Wyoming during 1964 and continued to spread in South Dakota. MEADOW SPITTLEBUG populations were the highest ever reported in Minnesota, caused considerable dwarfing of alfalfa in Michigan, and were again a problem on red and ladino clovers in Maryland. POTATO LEAFHOPPER was of economic importance on alfalfa in Ohio, Indiana, Michigan and Wisconsin, as well as in Missouri, Maryland and New Jersey. THREE-CORNERED ALFALFA HOPPER was extremely heavy on alfalfa in areas of Arizona, and LYGUS BUGS were heavy on seed alfalfa in the State during May, June and July, requiring controls. VARIEGATED CUTWORM was heavy and widespread on vetch in Texas, caused severe damage to alfalfa over Missouri, and was medium to heavy on alfalfa in most areas of Arizona in the spring. CORN EARWORM was heavy in southern Oklahoma where damage occurred to alfalfa.

ALFALFA WEEVIL (Hypera postica) extended its range in NEW HAMPSHIRE and now occurs in 6 southern counties, but no instances of economic damage were observed during the 1964 season. The weevil advanced northward through the southern counties of VERMONT during the season to the northern boundaries of Rutland and Windham Counties, with considerable damage to alfalfa occurring in Bennington County. The first overwintered alfalfa weevil adults of the season in MASSACHUSETTS were collected April 27, first eggs were observed May 5 and first-generation adults began appearing about May 27. Alfalfa weevil was more abundant in the State than in previous years and many fields of alfalfa that were not treated in the fall of 1963 were severely damaged. Alfalfa weevil comprised 97.7 percent of all beetles collected and about 29 percent of all insects collected in alfalfa during 1964. Fall oviposition by this pest was very light in Massachusetts compared with the 1963 season. Alfalfa weevil larvae and evidence of feeding in RHODE ISLAND became noticeable in Kingston, Washington County, in late May, and reports indicated a statewide buildup to populations greater than those observed in 1963.

A mild winter in NEW YORK resulted in a good carryover of alfalfa weevil and spread of the pest during the 1964 season was more rapid than at any time since 1957. Alfalfa weevil is now found in Chatauqua, Essex and Cayuga Counties. In all, 31 counties in the State are now known to be infested, but the focal point remains the Hudson Valley. Infestations at Fishkill reached over 2,000 per sweep, and in the lower Hudson Valley, treatment was essential if hay was to be harvested. H. postica continued very damaging to alfalfa in NEW JERSEY. More damage occurred during 1964 than in previous years and was probably due to a change in control chemicals. This weevil also continued to cause heavy damage to alfalfa in PENNSYLVANIA, with resistance to some insecticides becoming evident, especially in areas where the pest has been established for some time. Heaviest infestations occurred in the southern half of the State.

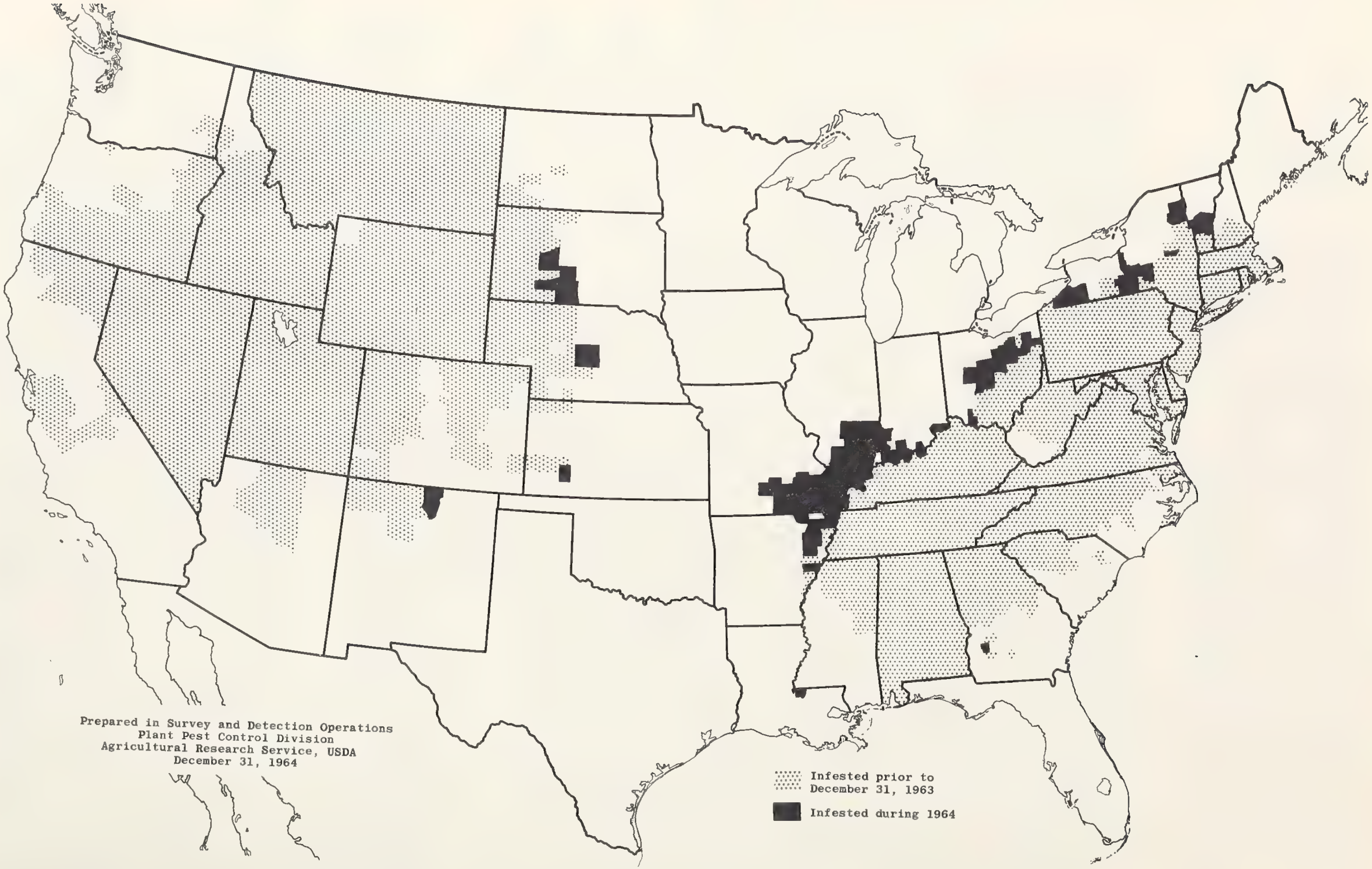
Early stage larvae of alfalfa weevil were feeding on alfalfa by March 14 in New Castle County, DELAWARE, and by the third week in April some fields showed rather heavy injury. Most untreated fields exhibited heavy injury to first-growth alfalfa by the second week in May. Injury to second cutting was very variable but generally light in most instances. A few larvae and some feeding injury were noted during late August and early September in Delaware. Egg counts in one field in New Castle County averaged 548 and 654 per 100 green and dead stems, respectively, on November 27. A high spring population is forecast for this area in 1965. Alfalfa weevil larval populations in MARYLAND were about normal in the spring, causing moderate to heavy damage to unprotected first-growth alfalfa. In late May and June, larvae and adults caused extensive damage to second-growth alfalfa in eastern and central sections of Maryland. H. postica caused considerable concern throughout VIRGINIA, especially on first and second cuttings of alfalfa. First and second-stage larvae appeared in medium to heavy infestations, with a few third and fourth instars reported. The pest was occasionally observed on ladino clover in Virginia. Lady beetles and damsel bugs were common in some infested fields.

Alfalfa weevil caused extensive damage to alfalfa in the Piedmont area of NORTH CAROLINA during the first half of April. This was due to the failure of growers to follow through with recommended spring treatments for weevils resistant to fall application of a chlorinated hydrocarbon. Control of alfalfa weevil in the mountain counties of North Carolina was fair to good with fall applications. Populations in the spring of 1965 are expected to be large due to the number of alfalfa weevil adults in the field in the fall of 1964. Larvae of this weevil were first observed during mid-March in northern GEORGIA. This insect has caused almost complete elimination of the planting of alfalfa in the State. When alfalfa weevil was first found in Georgia there were approximately 45,000 acres planted to alfalfa, but at the present time there are less than 10,000 acres in alfalfa. Infestations were generally absent to very low in fields treated in the fall of 1963, but fields not treated at that time had heavy infestations. Spring treatments in Georgia were mostly unsatisfactory. Alfalfa weevil was found for the first time in Terrell County, Georgia, during the 1964 season. Alfalfa weevil has become widespread in ALABAMA, and damage to alfalfa from 1960 to 1963 caused considerable reduction in alfalfa acreage in the State and prevented growers from planning additional acreage. Damage to the remaining acres of alfalfa during the 1964 season, except where control practices were adopted, was heavy.

Alfalfa weevil was reported for the first time in LOUISIANA during the 1964 season when 7 specimens were collected from crimson clover in East Feliciana Parish during April. This weevil was reported for the first time during 1964 in Craighead, Greene, Poinsett, Randolph, Cross and Lee Counties, ARKANSAS, and although it is now known to occur in 10 counties in the State, little damage occurred this season.

Alfalfa weevil was found in 18 additional counties in OHIO during the 1964 season, making a total of 48 counties now known to be infested in the State. Severe damage occurred in about 15 counties during the season from Mahoning in the north to Lawrence in the south. Alfalfa weevil is apparently still absent in MICHIGAN, as no specimens were collected during 1964, but the species was collected for the first time in INDIANA, being taken in 10 counties in that State. In each instance where alfalfa weevil was collected in Indiana,

DISTRIBUTION OF ALFALFA WEEVIL



Prepared in Survey and Detection Operations
Plant Pest Control Division
Agricultural Research Service, USDA
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there was no evidence of economic damage and generally only one or two specimens were obtained in each field. In no instance did numbers exceed one adult or larva per 500 sweeps with a 15-inch net. Alfalfa weevil was also found for the first time in ILLINOIS during the year, being collected near Cave in Rock in Hardin County on April 24. Adult populations varied 1-10 per 100 sweeps and larvae varied 0-1.4 per sweep during May and early June. Neither adults nor larvae of this curculionid were found from June 29 to November 10 when a single adult was taken in 500 sweeps. Between April 24 and June 12, a total of 29 counties in Illinois was found infested with this pest of alfalfa, but no economic damage occurred this season. The first report of this pest in MISSOURI was recorded in Pemiscot County on April 29, 1964, and surveys during the season revealed that the weevil was present in 21 counties in the southeastern corner of the State. Counts of 200 per 100 sweeps were recorded in Pemiscot County, 80-100 per 100 sweeps in Dunklin, New Madrid and Mississippi Counties, and 0-5 per 100 sweeps in other infested Missouri counties.

First adults and eggs of alfalfa weevil for the 1964 season in WASHINGTON were found in Whitman and Asotin Counties late in April. Adults were abundant by mid-June and all larval stages were present by early July. This is the second season that damage from this weevil has occurred in Washington. This pest of alfalfa appeared early in the season in that crop in CALIFORNIA and remained present well into the summer. The southern limit of this weevil in California is in Fresno and San Luis Obispo Counties. Alfalfa weevil infestations and damage to alfalfa were widespread in NEVADA this season. Females remained gravid longer than usual, resulting in an uneven and extended hatch from April into July. Peak larval populations and damage occurred early in July. Damage in Nevada during 1964 was increased due to lack of adult and larval controls and crop injury caused by a larvicide. Alfalfa weevil damage to first and second-crop alfalfa was generally light in UTAH, but was severe over limited areas, with little control being applied on the hay crop. As the season was very late in the State this year, damage to the second crop, as usual, was generally more severe than to the first crop.

Alfalfa weevil was found for the first time in Taos County, NEW MEXICO, during the 1964 season. This snout beetle, along with several other pests, caused reduction in yield of alfalfa in northeastern COLORADO this year, was not a problem on this crop in the southeastern section of the State, but did cause light to moderate loss to alfalfa in the southwest. In western Colorado, most loss to alfalfa was due to alfalfa weevil and pea aphid (Acyrthosiphon pisum). Adults were controlled early in the season on alfalfa stubble before egg laying was underway in the western counties of Mesa, Montrose, Delta and Garfield, where insecticides have been incorporated with commercial fertilizers and have worked with good results during the past two seasons. Removal of chlorinated hydrocarbons with long residuals from spray programs will present a problem in finding effective control of this pest. Larval control has never been too successful from the standpoint of spraying because of so many other demands on the time of growers. Loss from alfalfa weevil larvae was 1-2 percent in Mesa, Montrose, Delta and Garfield Counties. This is considered as light. Alfalfa weevil was not considered to be an important pest of alfalfa in the Arkansas Valley of Colorado during 1964. Larvae averaged less than 10 per 100 sweeps in most fields checked in Bent, Otero, Crowley and Pueblo Counties. In a few fields in Pueblo County, larvae did reach levels of 100 per 100 sweeps, but these were only isolated instances.

Alfalfa weevil was again the most damaging crop pest in WYOMING at it was in 1963; however, damage was not as severe in 1964 as it was in 1963. Adults were first noted in the northern area of the State on April 21, larvae first appeared in the area in late May and increased steadily until counts were as high as 3,000 per 100 sweeps in Big Horn County. Damage was not as severe in southern areas of Wyoming where the highest number of larvae was 1,500 per 100 sweeps in Goshen County. The greatest damage during 1964 was to second-cutting alfalfa. Alfalfa weevil larval populations in Lawrence County, SOUTH DAKOTA, about June 6 ranged 193-385 per 100 sweeps, with adult counts ranging 4-12 per 100 sweeps. This pest was reported for the first time from Haakon, Mellette, Todd, Jones and Washabaugh Counties, South Dakota, during the 1964 season. Damage to alfalfa by this curculionid was confined mainly to the Black Hills area of South Dakota, with fringe areas showing no evident damage. This pest extended its range eastward into central NEBRASKA this season with adults being observed for the first time in Custer County. Counts were light to moderate during the season and most damage was held in check by cropping practices. Alfalfa weevil populations remained at trace levels in KANSAS during 1964, but the pest was found for the first time in Gray County.

A WEEVIL (Hypera brunneipennis) infested alfalfa at various locations over CALIFORNIA during the season. Medium to heavy populations of this weevil caused moderate damage to alfalfa in ARIZONA in Yuma County and in areas of Maricopa and Pinal Counties, with peak populations occurring from late March to early April. Parasites were effective in reducing populations to noneconomic levels in many fields in Arizona.

CLOVER LEAF WEEVIL (Hypera punctata) infestations on alfalfa appeared early in various locations over CALIFORNIA. Larval activity was light in eastern and northeastern areas of NEBRASKA during April and May on legumes, and the weevil caused damage to second cuttings in KANSAS, particularly in the south central area of the State. Clover leaf weevil larvae ranged 1-10 per crown in fields of alfalfa and clover in the southern half of MISSOURI in early May, with 50-75 percent of larvae infected with a fungus disease. By mid-May, these populations had decreased to counts of less than 1 per 5 crowns to none observed. Larval populations of this weevil were fairly light (3-16 per square foot) in northern and eastern areas of ILLINOIS, but were moderate (3-56 per square foot) in western and southwestern areas of the State. Damage to clover was moderate and an estimated 11,224 acres were treated this season. Clover leaf weevil was very light on clover at locations in VIRGINIA where it occurred during the 1964 season, and larvae were rather common on clover in DELAWARE during the early spring when injury was noticeable in a few fields in New Castle and Kent Counties. In ALABAMA, clover leaf weevil damaged crimson and white clovers.

LESSER CLOVER LEAF WEEVIL (Hypera nigrirostris) caused some damage to crimson clover in ALABAMA and was the major cause of damage to white clover in the State. This weevil was noted on legume crops in MISSOURI during the past season, and caused heavy damage to red clover in Lyon County, NEVADA, in late May and June.

CLOVER HEAD WEEVIL (Hypera meles) was a major pest of crimson clover in ALABAMA during the 1964 season and was numerous on this crop during April in ARKANSAS. In LOUISIANA, populations were high in all white clover seed producing areas and caused severe losses where control measures were not practiced. Adult populations on fields of untreated white clover in central parishes peaked at more than one per sweep during the first week of April and declined thereafter. Infestations of heads of white clover in this area of Louisiana ranged 27-100 percent by mid-April in untreated fields.

SWEETCLOVER WEEVIL (Sitona cylindricollis) was found for the first time in Rio Arriba County, NEW MEXICO, where it infested alfalfa. Adult populations of this curculionid damaged sweetclover in some fields in NEBRASKA during late May and early June, and caused moderate damage to sweetclover in southeastern NORTH DAKOTA early in the 1964 season. Migrating adults of sweetclover weevil were unusually abundant in Whitman County, WASHINGTON, during August.

Several species of weevils, mainly CLOVER ROOT CURCULIO (Sitona hispidula), damaged several fields of soybeans following clover in ILLINOIS during June. An estimated 1,020 acres were treated for these pests. Examination of alfalfa roots of various ages in MISSOURI showed a yearly increase of feeding scars by larvae of this weevil, with counts averaging 9.4, 8.1 and 7.6 per root in Greene, Howell and Saline Counties, respectively. Adults of clover root curculio ranged

3-11 per 10 sweeps in legumes in NEBRASKA during late August and early September, and adults of another WEEVIL (*Sitona scissifrons*) were present in light numbers on legumes in the State but caused only minor damage. First adults of CLOVER SEED WEEVIL (*Miccotrogus picirostris*) emerged from duff in uncultivated fields in southeastern WASHINGTON in late May, with migration into white clover fields being delayed about 3 weeks due to cool weather. In ILLINOIS, a CLOVER WEEVIL (*Tychius stephensi*) was found for the first time in Marshall County during the 1964 season.

PEA WEEVIL (*Bruchus pisorum*) was responsible for the production of poor stands of Canadian field peas in several fields in ALASKA because of the high degree of damage caused to seed which was infested when imported into the State. This pest was about normal in UTAH during the season. VETCH BRUCHID (*Bruchus brachialis*) populations were widespread and heavy in the vetch-producing areas of TEXAS during 1964.

A SPOTTED CUCUMBER BEETLE (*Diabrotica undecimpunctata tenella*) was of only minor economic importance in alfalfa throughout NEW MEXICO this year. A COLASPIS (*Colaspis* sp.) was observed infesting legumes in MISSOURI during the 1964 growing season, and first adults of *Colaspis* sp. of the season in ILLINOIS were observed on alfalfa in Marion County on June 29. Populations of this pest were low on alfalfa, clover and other crops with no damage being observed. In VIRGINIA, a FLEA BEETLE (*Systena taeniata*) was of concern on alfalfa.

Populations of BLISTER BEETLES, mostly ASH-GRAY BLISTER BEETLE (*Epicauta fabricii*) and BLACK BLISTER BEETLE (*E. pennsylvanica*), ranged light to heavy and were common in alfalfa in many areas of NORTH DAKOTA during 1964. Adults of black blister beetle appeared in alfalfa in southern WISCONSIN late in July and numbers increased rapidly; however, although high numbers were present, they were still somewhat lower than in 1963. Populations of black blister beetle, MARGINED BLISTER BEETLE (*E. pestifera*), ash-gray blister beetle and a STRIPED BLISTER BEETLE (*Epicauta* sp.) were low on alfalfa in ILLINOIS until August, when counts of 4 per sweep were found. In some instances, cattle were reluctant to eat "greenchop." In NEBRASKA, counts of *Epicauta* spp. ranged 2-6 per 10 sweeps in legumes throughout the season. *Epicauta* sp. was present and caused little damage in OKLAHOMA, but unspecified blister beetles caused some damage to crimson clover in ALABAMA. Black blister beetle and a striped blister beetle (*Epicauta* sp.) were medium on alfalfa in locations where they occurred in VIRGINIA during the 1964 season.

PEA APHID (*Acyrthosiphon pisum*) ranged up to 9 per tip on alfalfa in late April in Walla Walla and Yakima Counties, WASHINGTON, with a few alates present. Alates built up in late August and all stages were numerous in some fields by mid-September. Infestations of this aphid occurred early in the season on alfalfa at various locations throughout CALIFORNIA. Pea aphid infestations in NEVADA were above the 1963 level, with treatments required or applied in Lincoln, Lyon, Nye, Pershing and White Pine Counties. Light to medium populations of pea aphid were predominant in alfalfa in ARIZONA during spring growth, peaking during late April. These reduced infestations caused little damage to early spring alfalfa in the State this season. Pea aphid was mostly light and spotted in alfalfa over NEW MEXICO, except for several fields near Fort Sumner, De Baca County, which required treatment, and several fields near La Plata, San Juan County, where damage from this aphid was noted.

Pea aphid, in combination with other insect species, caused reductions in alfafa yields in northeastern COLORADO during 1964. Losses in this area ranged 5-15 percent, with most caused by pea aphid. Considerable loss to second-cutting alfalfa was also sustained in this same area of the State. Pea aphid caused some damage to second and third cuttings of alfalfa in southeastern Colorado, where losses from this aphid and other alfalfa pests also ranged 5-15 percent. Pea aphid, in combination with alfalfa weevil (*Hypera postica*) caused slight to moderate losses to alfalfa in southwestern Colorado, but pea aphid was again responsible for most of the loss in this area. Alfalfa seed production was reduced by this aphid in the western portion of the State during 1964. Populations were light on first cutting of alfalfa in Mesa, Montrose, Delta and Garfield Counties, building up to high numbers on the second cutting in July. Predator populations which built up 2 weeks behind pea aphid aided in the control of the large aphid population in these counties. The principal predator was CONVERGENT LADY BEETLE (Hippodamia convergens), but chemical controls were used in some fields. Generally, pea aphid did not develop high populations on alfalfa in the Arkansas Valley of Colorado during 1964. During the latter part of June, populations reached an average high of 2,000 per 100 sweeps and varied 50-7,000 per 100 sweeps. Thereafter, populations in the Arkansas Valley declined rapidly and pea aphid existed only in small numbers. Pea aphid populations in WYOMING during 1964 slightly exceeded those present in the State during the 1963 season. First specimens in 1964 were collected May 20 in the northwest area of the State and increased steadily until mid-July when counts averaged 3,500 per 100 sweeps in northern areas and 2,450 per 100 sweeps in southeastern and southwestern areas. The most severe damage in Wyoming during 1964 was found in Natrona County where some control was necessary.

Pea aphid did not reach damaging proportions in NORTH DAKOTA during the 1964 season. In WISCONSIN, eggs hatched by April 9 near Brodhead, Green County, and aphids were about half grown a week later. Stem mothers were nearly mature by April 24 and many were forming embryos. Pea aphid populations were as high as 100 per sweep in alfalfa in this area by May 8. On October 9, populations as high as 1,000 per sweep on alfalfa were noted, and eggs were being laid by October 16. Adult and nymphal populations of pea aphid increased markedly in regrowth alfalfa in many areas of lower MICHIGAN in early September and continued high into October, with an average of 40 per sweep being taken in Ingham and Livingston Counties on September 8. Pea aphid was of minor importance in OHIO during the 1964 season.

Pea aphid populations in INDIANA reached maximum densities by mid-July and rapidly decreased thereafter. Maximum populations in alfalfa, averaging 60 or more adults and nymphs per sweep, were observed in northeastern and north central sections of the State, but even these populations were generally noneconomic. Pea aphid populations were generally light throughout ILLINOIS this year. Populations as high as 200 per sweep in the southern half of the State and as high as 280 per sweep in the northern area were found just prior to removal of the first cutting of hay. It is questionable whether any treatments were justified in Illinois during the season but an estimated 15,110 acres were treated. Pea aphid counts in MISSOURI ranged 1,000-30,000 per 100 sweeps in southwestern, southeastern and south central areas of the State during the early spring, but dropped rapidly about the latter part of May and remained low the remainder of the 1964 season. Pea aphid populations were very low on legumes in NEBRASKA throughout the season with no economic damage reported, and populations were locally heavy in areas in the eastern half of KANSAS in the spring of 1964 as they were in 1963.

Pea aphid was present on overwintering alfalfa in OKLAHOMA, but counts remained very low from January through mid-April. Populations increased during late April until limited spraying was necessary and continued to increase until mid-May. At this time, numbers began decreasing until activity ceased in late June. Pea aphid was first noted in ARKANSAS on March 13 and counts were high by April 15, but decreased as temperatures rose. Numbers were again high in Arkansas in early November. Heavy populations of pea aphid occurred on legumes in northern and north central areas of TEXAS during the 1964 season.

Infestations of pea aphid ranged from very light to light on alfalfa and clover in various parts of VIRGINIA, and numbers were slightly below normal in MARYLAND, with populations over the 100-per-sweep level occurring in a moderate number of fields in all sections of the State from May through August. In DELAWARE, populations of this aphid were rather high, ranging 500-1,000 per 100 sweeps on alfalfa in many areas by mid-April. Numbers continued to increase in Delaware and by late April to mid-May populations ranged 200-2,000 per 100 sweeps in many fields. High populations of pea aphid built up on alfalfa in PENNSYLVANIA during April, causing some damage, but were then practically eliminated by fungus disease and parasites. Pea aphid populations were very low in NEW JERSEY early in the 1964 season but increased later in some areas. Generally, pea aphid was somewhat heavier on alfalfa in the State this year than it was in 1963. Pea aphid was very common on alfalfa and alfalfa mixtures statewide in RHODE ISLAND, but parasitized individuals were numerous in all infested fields observed. Populations on alfalfa in MASSACHUSETTS were relatively low until mid-June. By the end of the 1964 season, however, this pest had increased until it composed 49.9 percent of all insects collected from alfalfa in Massachusetts this year.

SPOTTED ALFALFA APHID (Therioaphis maculata) infestations were slightly heavier in ARKANSAS this year than they were in 1963, probably because of dry weather. Numbers were much lower in the eastern portion of the State than in the western area. Counts were zero in the early part of the year, following cold weather, but first infestations were found during March. Numbers decreased during heavy rains in August, then increased during the dry weather of October and November in the northwest section of Arkansas. Spotted alfalfa aphid infestations in TEXAS were similar to those that occurred in 1963 with little significant damage. In OKLAHOMA, light populations of this pest were present on overwintering alfalfa in most areas during January, but cold weather reduced populations which remained low until late April. Spotted alfalfa aphid increased during May and June in Oklahoma and began damaging alfalfa in some areas. In other areas of the State, very little increase was evident and numbers remained low on alfalfa throughout the season. Activity of this aphid declined in early October and infestations were light to absent in most areas by mid-November. In MISSOURI, the highest counts of spotted alfalfa aphid ranged 1,000-2,500 per 100 sweeps in the southwest area during late May.

Spotted alfalfa aphid appeared in southern KANSAS in early April, but was not found in the northern portion of the State until late June or July. By late July, populations were building up sufficiently to cause severe damage in central and southern areas of Kansas. Growers cut most fields early to reduce damage rather than relying on sprays. First infestations of this aphid were found in mid-April in NEBRASKA. Populations remained low in all areas until mid-July, then fluctuated throughout the remainder of the season. Very few problems of economic significance were found in Nebraska during the 1964 season, although numbers in the panhandle area were higher than in previous years.

First specimens of spotted alfalfa aphid for the 1964 season in ILLINOIS were found April 28 in Macoupin and Adams Counties. Populations were low in alfalfa in southern and western areas until October when unseasonably warm, dry weather permitted a late season builup to as many as 800 per sweep in early November. Overall populations of this aphid in WISCONSIN decreased somewhat in 1964. This was attributed to dispersal into previously uninfested fields of alfalfa. As in 1963, the population peak in Wisconsin did not occur until mid-October. Eggs were hatching by April 16 and winged forms appeared by May 7. Spotted alfalfa aphid populations were low in Wisconsin throughout the summer and never increased substantially until October. Dispersal was well underway by late May and continued throughout the summer of 1964. First sexual forms appeared during the first week of October. Counts per sweep in an observation field near Brodhead, Green County, peaked at approximately 900 per sweep during the period October 15-22. At this same time in 1963, peak counts in this same field were approximately 1,500 per sweep. Egg counts per alfalfa stem in the Brodhead area of Wisconsin reached a high of slightly under 20 per stem October 4-19, 1964, and at the same time in 1963 the high count was 80 per stem on October 19. Spotted alfalfa aphid continued to spread into new areas of SOUTH DAKOTA during the 1964 season and first specimens of the year were collected May 2. This collection date is approximately 2 weeks earlier than that of 1963. This insect was found for the first time in Bennett, Washabaugh, Haakon, Lake, Moody, Deuel and Brown Counties for the first time during 1964. Populations never reached economic levels in South Dakota even though present throughout most of the season. Sexual forms of spotted alfalfa aphid were collected as early as October 12 in Union County. Other collections of sexual forms were made in Hutchinson, Clark and Lake Counties.

Spotted alfalfa aphid was detected in WYOMING for the first time during 1964 when specimens were collected in a field of alfalfa at Torrington, Goshen County, on October 14. In southeastern COLORADO, spotted alfalfa aphid caused some loss to second and third cuttings of alfalfa, and was a problem on newly seeded alfalfa during August and September. Losses to alfalfa in this area ranged 5-15 percent, due to this aphid and several other pests of this crop. Trace numbers of spotted alfalfa aphid occurred in alfalfa in the western portion of Colorado in Mesa, Montrose, Delta and Garfield Counties, but numbers remained light all season. Spotted alfalfa aphid was first found in the Arkansas Valley area of Colorado in fields south of Swink, Otero County, on July 2 when counts ranged 1-2 per 100 sweeps. It is very likely this pest would have been found earlier, had surveys been conducted in Baca County. Populations of this aphid averaged 2,500 per 100 sweeps the first part of September, with extremes of 5,000-6,000 per 100 sweeps. Very little damage occurred to established stands ofalfalfa in the Arkansas Valley this season although in some areas newly planted stands of this host were destroyed. In NEW MEXICO, only an occasional infestation of spotted alfalfa aphid built up to the point where chemical controls were necessary during the 1964 season, and mostly in the Pecos Valley. Spotted alfalfa aphid infestations were generally light in alfalfa during the year in ARIZONA, with peak infestations occurring during April and again in October. Only small, scattered infestations of the pest caused concern in Yuma, Maricopa and Pinal Counties.

Spotted alfalfa aphid populations were heavier in central counties of NEVADA than they had been during the previous 2 years. Populations of the pest were below normal in the extreme south, but in areas of Churchill, Esmeralda, Eureka, Nye and White Pine Counties, infestations required controls, especially in the fall. Spotted alfalfa aphid infested alfalfa at various locations over CALIFORNIA early in the 1964 season.

CLOVER APHID (*Anuraphis bakeri*) caused sticky seed in several red clover seed fields in Humboldt County, NEVADA, and unspecified APHIDS caused some damage to red and white clovers in ALABAMA during the 1964 season.

MEADOW SPITTLEBUG (*Philaenus spumarius*) populations that were present in the Wabasha, Winona and Houston Counties, MINNESOTA, during May and early June were the highest ever reported in the State. Counts averaged nearly one per stem in some fields of alfalfa, but after the first cutting, populations were low and remained so the rest of the 1964 season. Eggs of meadow spittlebug hatched in WISCONSIN by May 1, and populations averaged about 5 per 10 stems a week later, being highest in southwestern counties. Adults appeared in Wisconsin about June 12, but good growth of alfalfa minimized damage. Infestations of this pest were very light in most areas of ILLINOIS this season. A fall survey showed a small area in the northwest section of State with light to moderate infestations present. It is questionable whether any treatments were justified in Illinois, except in this area; however, an estimated 19,933 acres were treated. Most of this acreage was outside the more heavily infested area and probably was treated at an economic loss to the farmers.

Nymphal populations of meadow spittlebug reached economic levels in INDIANA during the 1964 season primarily in the central section of the State where nymphal masses on alfalfa averaged 15 per 10 stems. Populations also approached economic levels in southwestern Indiana, reaching an average density of 8 spittle masses per 10 stems. Adult populations were insignificant in Indiana this season. Over 50 percent of the meadow spittlebug populations in alfalfa and clover fields in southwest MICHIGAN emerged as adults during the week ending June 12, at which time more than 25 adults per sweep were taken from some fields in Van Buren County. These high populations had caused considerable dwarfing injury to alfalfa terminal growth earlier in the season. Injury by this pest was also reported from Ionia, Muskegon, Tuscola, Sanilac, Osceola and Leelanau Counties. In OHIO, meadow spittlebug populations were at low to moderate levels over most of the State during 1964, with the first hatch almost 2 weeks later than usual.

Meadow spittlebug infestations ranged from very light to light on alfalfa and clover throughout VIRGINIA, but were again a problem on red and ladino clovers in western and central sections of MARYLAND during the year. This pest caused very little or no damage to hay crops in NEW JERSEY during 1964, and although present statewide in RHODE ISLAND, was less conspicuous than in 1963. Infestations appeared late in Rhode Island and built up slowly. In NEW YORK, first spittle masses were found May 3 in Jefferson County. These bugs had probably emerged from eggs a day or two earlier, and had probably appeared a week earlier in the Hudson Valley. Spittlebugs, although numerous, were not as widespread or as heavy in numbers as on previous occasions. Locally serious infestations did occur in the Hudson Valley and in western and the Finger Lakes areas of New York this season. In MASSACHUSETTS, heavy populations of unspecified SPITTLEBUGS were noted in western counties during the season.

POTATO LEAFHOPPER (*Empoasca fabae*) was damaging to second and third cuttings of alfalfa over the entire State of OHIO during 1964. Damage, however, was somewhat spotted and drought made it difficult to determine the exact amount of injury. First adults of the season in MICHIGAN were collected in late May from Livingston and Monroe Counties. Populations of this leafhopper built up and were heavy in late June in Monroe and Allegan Counties. High populations continued in many areas of Lower Michigan during July and August on alfalfa and other crops. Economic populations of potato leafhopper again occurred in many areas of INDIANA. This species was most abundant during 1964 in the northwest section of the State, reaching maximum populations of 12 adults per sweep by mid-June and then gradually declining. Populations of potato leafhopper in the central east-to-west third of the State remained stable through July, averaging about 3 adults per sweep, then declined somewhat in August. Lowest populations were observed in the southern third of Indiana, particularly in the southeast section. The most significant damage to alfalfa by this pest developed during late August to mid-September, reflecting the drought conditions experienced throughout the Hoosier State during 1964. The first potato leafhopper specimen of the season in ILLINOIS was taken in a light trap at Urbana on March 27, and first specimens swept from alfalfa were taken in Hardin and Johnson Counties in the southern area of the State on April 24. Main migrations of potato leafhopper into Illinois during 1964 occurred May 10-15. Very light to severe yellowing was observed in 25 percent of alfalfa in the west, west-southwest and central districts during the period July 6-9. Yellowing was noticed in the northern sections of the State July 27-30. An estimated 25,650 acres of alfalfa were treated for the control of potato leafhopper in Illinois during the 1964 season.

Potato leafhopper adults began appearing in light traps in WISCONSIN the first week in May and in alfalfa by May 29. Yellowed margins in fields of alfalfa were first noted by June 19. Populations of potato leafhopper were as high as 100 per sweep in localized areas of Wisconsin, and some alfalfa was treated. This pest was abundant through September and persisted until October 23. Potato leafhopper infestations ranged 2-22 per 10 sweeps in alfalfa in NEBRASKA, but no damage to this crop was reported this year. Heavy numbers of potato leafhopper built up throughout MISSOURI generally on second and third-cutting alfalfa this season. Counts per 100 sweeps on this crop ranged from 2-7 in the southeast on May 9 to 100-200 in the southwest and west central areas on August 1, and 200 per 100 sweeps in the northwest on August 20. Overwintering populations of potato leafhopper ranging 10-40 per 100 sweeps were common on burclover and waxmyrtle in the Baton Rouge area of LOUISIANA during December.

The first noticeable infestations of potato leafhopper in MARYLAND occurred during late June on alfalfa in Frederick and Queen Annes Counties. Yellowing of alfalfa was observed in all sections of Maryland during July and August. This leafhopper is the most important midsummer pest of alfalfa in Maryland. Potato leafhopper was present on alfalfa and soybeans in DELAWARE during early July, but was considerably more numerous on these and other crops during late July and early August. Potato leafhopper caused yellowing of alfalfa in some areas of PENNSYLVANIA during late June, and was again quite severe in NEW JERSEY during the season with great numbers being found on alfalfa. Potato leafhopper was also active in legume hay fields in VERMONT where it caused some yellowing.

Leafhoppers represented 10.1 percent of all insects collected from alfalfa in MASSACHUSETTS during the 1964 season, with potato leafhopper, PAINTED LEAFHOPPER (Endria inimica), CLOVER LEAFHOPPER (Aceratagallia sanguinolenta) and Errastunus ocellaris being the most abundant in the order named. Potato leafhopper was not as abundant in the early part of the season as is usual. In RHODE ISLAND, Athysanus argentarius and Doratura stylata were very numerous in hay in the Kingston area of Washington County during midsummer. Populations of SIX-SPOTTED LEAFHOPPER (Macrosteles fascifrons) were very low in NEBRASKA causing no major damage in legumes this season. Clover leafhopper was about average in UTAH during 1964. Heavy populations of a LEAFHOPPER (Empoasca mexara), ranging up to 1,500 per 100 sweeps, caused late summer injury to alfalfa in Yuma County, ARIZONA. Peak populations were reached during August and early September. E. mexara was found for the first time in CALIFORNIA in 1964 when it was found infesting alfalfa in Imperial County.

THREE-CORNERED ALFALFA HOPPER (Spissistilus festinus) infested alfalfa at several locations in the San Joaquin Valley of CALIFORNIA this past season. This species has not been a pest in this area of the State previously. Extremely heavy infestations of this membracid occurred in alfalfa in western and central areas of ARIZONA, where severe girdling damaged many fields during 1964. Counts in these areas ranged as high as 4,000-6,000 per 100 sweeps. Moderate infestations of this pest occurred in the eastern portion of Arizona. In UTAH this membracid was about average this season. Three-cornered alfalfa hopper was light throughout the growing season in OKLAHOMA, with highest counts occurring in early October. In TEXAS, six-spotted alfalfa hopper infestations occurred on alfalfa in the Brazos-Burleson County area, with locally heavy infestations reported in the upper gulf coast region of the State.

LYGUS BUGS (Lygus spp.) were first noted in alfalfa in OKLAHOMA during mid-March, and by mid-May, infestations were common in most fields. Populations increased to heavy only in isolated areas for short periods during the 1964 season, but activity did continue until mid-November. Lygus bugs caused some loss to alfalfa yields in southeastern COLORADO and were responsible for reduction in alfalfa seed production in the western portion of the State. Populations of these bugs on alfalfa in the Arkansas Valley developed early in June when counts varied 200-300 per 100 sweeps, after which numbers declined. Precautionary sprays were applied to many fields of alfalfa in this area of Colorado. Populations of lygus bugs in alfalfa-seed crops in WYOMING during the 1964 season were comparable with those present in 1963. Slight damage from these pests occurred in all areas of the State, with greatest damage being noted in the Fremont County area. First specimens appeared in the northern portion of Wyoming on May 19 and increased until mid-August when an average of 250 adults and nymphs per 100 sweeps was found. The bugs were first noted in the southern area of the State on May 7 and counts increased steadily until early August, at which time adults and nymphs averaged 220 per 100 sweeps. Lygus bugs were moderate on alfalfa late in the 1964 season in southeastern NORTH DAKOTA.

First adults of Lygus hesperus and L. elisus were noted on alfalfa in WASHINGTON by early May. Development was delayed by cool weather, with only one adult per sweep on alfalfa in Franklin County by late June. In late July, however, counts of these bugs were up to 13 per sweep in reinfested portions of treated fields of alfalfa in Franklin County, Washington. Lygus bugs required considerable control treatment in nearly all forage crops in CALIFORNIA during 1964. Populations of lygus bugs were normal on seed alfalfa in NEVADA this year. Infestations were heavy on seed alfalfa in ARIZONA during May, June and July, requiring some chemical controls, and migrations to cotton were heavy this season in Arizona.

PLANT BUGS were about as abundant as usual on alfalfa in MASSACHUSETTS, comprising 5.2 percent of all insects found on this crop in 1964. Of these plant bugs, TARNISHED PLANT BUG (Lygus lineolaris) numbered 65 percent. First adults of tarnished plant bug for the season in DELAWARE were noted on alfalfa on April 16. By late May and throughout June, adults were rather common on this crop, apparently reaching peak numbers during early to mid-July when populations averaged one per sweep in many areas of Delaware. Tarnished plant bug was abundant again in MARYLAND this season in fields of alfalfa and clover, especially in fields in or near blossom. Tarnished plant bug caused some damage to crimson and white clovers in ALABAMA during 1964, and was noted on legumes in MISSOURI. First nymphs of this mirid of the season in ILLINOIS were observed in Hardin County on May 6, but populations remained fairly low in the State this year. Tarnished plant bug adult activity was common in NEBRASKA by mid-April. Populations remained low, with some buildup occurring in early June and then dropping off. Light fall infestations of this legume pest in Nebraska were concentrated on ornamental plants in gardens.

ALFALFA PLANT BUG (Adelphocoris lineolatus) populations in WYOMING during 1964 were about the same as they were in 1963. First adults of the season were collected May 26 in the northern part of the State. Numbers increased until early August when counts averaged 64 per 100 sweeps in the northern area and 52 per 100 sweeps in southern areas. Populations of this plant bug remained light in NEBRASKA this year and caused very little damage to legumes. First alfalfa plant bug nymphs of the season in ILLINOIS were observed on southern area alfalfa April 27, and first adults on May 19. Nymphs reached their highest population of 20-1,240 (average 217) per 100 sweeps in clover and alfalfa in the northern half of the State May 25-28.

RAPID PLANT BUG (Adelphocoris rapidus) populations were very light in NEBRASKA in 1964 and caused very little damage to legumes. First nymphs of the season in ILLINOIS were observed in Pulaski County on April 15. The greatest number of nymphs found in any field during the season was 7 per sweep and the greatest number of adults was one per sweep. Rapid plant bug was noted on legumes in MISSOURI during the season and caused some damage to crimson and white clovers in ALABAMA.

FALSE CHINCH BUGS (Nysius spp.) were reported on a wide variety of forage crops from most all areas of TEXAS during the 1964 season.

GREEN CLOVERWORM (Plathypena scabra) caused some damage to clover and alfalfa in ALABAMA, and damaged alfalfa in Brazos and Burleson Counties, TEXAS, as well as in northern portions of the State. Light larval populations of this noctuid were present on alfalfa in OKLAHOMA from mid-April through mid-September. Larvae were noted on legumes in MISSOURI during the season, as well as on clover and alfalfa in ILLINOIS. A larval outbreak of green cloverworm began in late July in MICHIGAN and continued through the third week of August. Declining numbers of larvae continued present in some fields of soybeans in Michigan until mid-September, but only foliage injury was noted on this host. First green cloverworm larvae of the season in DELAWARE were noted on alfalfa during the first week of June in New Castle County, and by late June, larvae were rather common on this crop and on soybeans throughout the State. Peak larval populations in Delaware occurred during late July and again in late August. Green cloverworm was an unusual problem on forage crops and on beans in NEW YORK during the past season.

VARIEGATED CUTWORM (Peridroma saucia) was first noted in ILLINOIS when very young larvae were observed on clover and alfalfa in the southwest district on April 29. Populations were slightly higher than they were in 1963, and controls were applied to an estimated 7,291 acres in Illinois during the 1964 season. Variegated cutworm caused severe damage to new growth and second-cutting alfalfa over MISSOURI this season. Larval counts on alfalfa ranged 0-8 per square foot. Larvae of this noctuid moth caused some damage to second-cutting alfalfa in eastern KANSAS, and widespread populations were heavy in vetch-growing areas of TEXAS this year. Medium to heavy spring populations of variegated cutworm occurred on alfalfa in most areas of ARIZONA in May and June, and scattered, heavy infestations appeared on this crop during August and September.

FALL ARMYWORM (Spodoptera frugiperda) first became active on grain sorghum in OKLAHOMA in 1964, but populations increased until heavy numbers were damaging alfalfa and other crops. This pest remained active in Oklahoma this year until late November. Fall armyworm larvae caused some damage to newly seeded alfalfa in western KANSAS. In NORTH CAROLINA, larvae averaged 6.5 per square foot in unstripped areas of a field of alfalfa in Wake County.

CORN EARWORM (Heliothis zea) activity began in alfalfa in OKLAHOMA in early May and by early June, infestations were common in this crop in the southern half of the State. Infestations continued to increase until heavy populations were damaging alfalfa and other crops in the State during early July. Infestations remained moderate to heavy in Oklahoma through September and activity continued until late October. BEET ARMYWORM (Spodoptera exigua) populations caused severe damage to alfalfa in areas of Brazos and Burleson Counties, TEXAS, and FORAGE LOOPER (Caenurgina erechtea) caused some damage to fall seeded alfalfa in eastern KANSAS.

ALFALFA LOOPER (Autographa californica) appeared in alfalfa early in the season at various locations over CALIFORNIA. Larvae of this pest were numerous on third cutting of alfalfa hay in some areas of Mesa, Montrose, Delta and Garfield Counties, COLORADO, this season, but no controls were necessary. ARMY CUTWORM (Chorizagrotis auxiliaris) caused some reduction in alfalfa yields in northeastern COLORADO, and damaged fields of alfalfa in Humboldt County, NEVADA, in May. Also in Nevada, populations of ZEBRA CATERPILLAR (Ceramica picta) were above the 1962-1963 levels in Churchill and Pershing Counties, but were not economic.

ALFALFA CATERPILLAR (Colias eurytheme) caused some damage to alfalfa in ALABAMA during 1964. Larvae of this pierid butterfly became active in OKLAHOMA in mid-March, but populations were very light throughout the season. Alfalfa caterpillar infested legumes in MISSOURI this year, and light larval and adult activity was noted in legumes in NEBRASKA during August and September. Alfalfa looper caused some damage to second and third cuttings of alfalfa and southeastern COLORADO, but was not economically important on alfalfa in the Arkansas Valley during the 1964 season. In NEW MEXICO, larval populations of this pest were much lighter on alfalfa in Chaves and Eddy Counties than they were in 1963.

GARDEN WEBWORM (Loxostege similalis) was reported as heavy in fall-seeded alfalfa in western ILLINOIS in early August. Larvae caused light to heavy damage to alfalfa over MISSOURI this season, but damage was heaviest in the southwest and west central areas of the State. Garden webworm activity remained low in OKLAHOMA until late July. Populations became damaging in the central area of the State during August and early September, but by mid-September, most infestations had disappeared. WEBWORMS (Loxostege spp.) caused some damage to fall seeded alfalfa in eastern KANSAS this season. In CALIFORNIA, larvae of a LEAF TIER MOTH (Udea profundalis) and larvae of a LEAF ROLLER MOTH (Platynota stultana) infested alfalfa at various locations over the State during the 1964 season.

ALFALFA SEED CHALCID (Bruchophagus roddi) damaged alfalfa in Collingsworth County, TEXAS, and an unspecified species infested seed of a local astragalus in ALASKA which is of potential forage value in that State.

THRIPS caused some reduction in yields of alfalfa in northeastern COLORADO this season, and infestations of Frankliniella sp. were heavy on alfalfa in Clark County, NEVADA, during April. GARDEN SPRINGTAIL (Bourletiella hortensis) populations were extremely heavy on forage crops in OHIO during mid-May.

SPIDER MITES (Tetranychus spp.) damaged clover along edges of fields in Cumberland County, PENNSYLVANIA, and again caused conspicuous injury to several fields of red clover in eastern and southern areas of MARYLAND during June. Tetranychus spp. populations were low statewide in NEVADA except in southern Nye County where several fields of alfalfa required treatment in the spring. Unspecified MITES were quite prevalent in forage crops in CALIFORNIA during the 1964 season.

SOYBEAN AND PEANUT INSECTS

Highlights:

CORN EARWORM occurred as a severe outbreak on soybeans in southeastern Missouri and the outbreak of this pest on soybeans in Arkansas was the heaviest and most widespread ever experienced in that State. Corn earworm was damaging to soybeans in Oklahoma, Louisiana, Georgia, North Carolina and Maryland, and to peanuts in Oklahoma and Georgia. CABBAGE LOOPER was a major pest of soybeans in Alabama and GREEN CLOVERWORM was also of some importance on this crop in that State. FALL ARMYWORM infestations were quite heavy and more severe on peanuts in Georgia than in recent years and was heavy on this crop in Florida. GARDEN WEBWORM caused heavy damage to soybeans in southwestern and west central Missouri, and LESSER CORNSTALK BORER was the principal pest of peanuts in Texas for the third consecutive year. BEAN LEAF BEETLE caused light to heavy defoliation of soybeans in Georgia, and was damaging to young soybeans in many fields over Missouri. SOUTHERN CORN ROOTWORM was again a problem to some peanut growers in southwestern Georgia. THRIPS were heavy on soybeans in various areas of Virginia, and caused widespread streaking and some stunting of soybean plants in all sections of Maryland.

The CORN EARWORM (Heliothis zea) outbreak on soybeans in southeastern MISSOURI was severe. Larvae averaged 50 per 3 feet of row in some fields, with 90-100 percent of pods damaged in many fields. The heaviest and most widespread outbreak of corn earworm on soybeans ever experienced in ARKANSAS occurred during the 1964 season. Infestations were also heavy on several other crops. Moth collections in light traps were high, but somewhat lower than in 1963; however, larval infestations in soybeans were the heaviest and most widespread ever experienced in the State. Counts ran as high as 30-40 larvae per 3 feet of row. One larva per 3 feet of row is considered economic. A survey showed that 59 percent of the 3,000,000 acres of soybeans in Arkansas required the application of controls for this pest this season. This is the third consecutive year that outbreaks of corn earworm have occurred in Arkansas about August 25. Corn earworm activity in OKLAHOMA began on alfalfa in early May, and by early June, infestations were common on this crop in the southern half of the State. Infestations continued to increase until heavy populations were damaging peanuts and other crops during early July. Infestations remained moderate to heavy in Oklahoma through September and activity by this pest continued until late October.

Corn earworm infestations on soybeans were generally light over LOUISIANA, but damaging populations of 2-5 larvae per 3 feet of row did develop during late August and early September in northeastern parishes. Corn earworm was a major pest of soybeans in ALABAMA during 1964, with major damage occurring from the central area of the State to the gulf coast. Some damage was also reported throughout the State. Corn earworm larval damage to peanuts ranged light to moderate in GEORGIA, and larvae caused serious losses to soybeans by feeding on small pods. Corn earworm infestations resulted in the treatment of an estimated 6,000 acres of soybeans in Hyde County, NORTH CAROLINA, during late August and early September, and in combination with Trichoplusia spp., was responsible for the treatment of an estimated 30,000 acres of soybeans in Perquimans, Pasquotank, Camden and Currituck Counties, North Carolina, during early September.

Corn earworm larvae caused moderate to heavy injury to pods in several fields of soybeans on the lower Eastern Shore of MARYLAND during mid to late September. Peak moth flight of corn earworm occurred in DELAWARE during the last week of August and the first week of September, when counts averaged 60 per night in one blacklight trap. Considerable larval injury to late plantings of soybeans and other crops followed this peak flight.

GREEN CLOVERWORM (*Plathypena scabra*) was of some importance on soybeans in ALABAMA during the 1964 season, but the earliest occurrences of the species in ARKANSAS were on crimson clover and alfalfa in April and May. Larvae persisted on alfalfa throughout the season, even into November, but numbers remained low on soybeans until late August and early September when populations increased; however, few infestations on soybeans were economic. Moths of this pest were active in Arkansas to mid-November. Green cloverworm infested soybeans in MISSOURI and in ILLINOIS during the season. Populations in most fields of soybeans in Illinois varied from zero to 2 or 3 per foot of row and, in combination with other insects, caused some leaf feeding damage in most areas of the State. In the northern section of Illinois, 12-15 larvae per foot of row were reported, with extensive defoliation noted in early August. An estimated 24,270 acres were treated to control this pest in 1964. Green cloverworm caused moderate to heavy damage in several fields of soybeans in northern OHIO during August. First larvae of green cloverworm for the season in DELAWARE were noted on alfalfa during the first week of June in New Castle County, and by late June were rather common on this crop and on soybeans throughout the State. Peak larval populations occurred during late July and again in late August.

CABBAGE LOOPER (*Trichoplusia ni*) was a major pest of soybeans in ALABAMA during the 1964 season, with major damage occurring from the central portion of the State to the gulf coast. Some damage to soybeans also occurred throughout the State. Heavy populations of cabbage looper and *Pseudoplusia includens*, but predominantly *P. includens*, developed on soybeans throughout LOUISIANA during August and September, causing more than 50 percent foliage loss in untreated fields. Infestations of cabbage looper were lighter in ARKANSAS during 1964 than they were in 1963, and as usual, disease was instrumental in keeping these infestations at a low level. Cabbage looper infested soybeans in OKLAHOMA this season but caused little damage to the crop.

LOOPERS (*Trichoplusia* spp.) in combination with corn earworm (see note on page 197) were responsible for the treatment of 30,000 acres of soybeans in several counties of NORTH CAROLINA during early September. *Trichoplusia* spp. were much more serious on soybeans in Camden and Currituck Counties where they destroyed 70-80 percent of the leaf surface in several fields. In GEORGIA, defoliation of soybeans was light to heavy but ranged mostly light to moderate.

FALL ARMYWORM (*Spodoptera frugiperda*) was quite heavy and more severe than in recent years in GEORGIA, being general over the State on peanuts and several other crops. Infestations were heavy on peanuts in Jackson County, FLORIDA, during late summer. This armyworm was also of some importance on soybeans in ALABAMA this season. Fall armyworm became active in OKLAHOMA on grain sorghum in early August and increased until heavy populations were damaging a wide variety of crops throughout the State, including soybeans. Activity continued until late November in Oklahoma. YELLOW-STRIPED ARMYWORM (*Prodenia ornithogalli*) infested soybeans in small numbers, as well as cotton, in ARKANSAS during the spring of 1964, but persisted later into the season than usual. One known infestation on soybeans became economic.

GRANULATE CUTWORM (*Feltia subterranea*) caused severe local damage to peanuts in Houston County, TEXAS, and caused light to moderate defoliation of this crop throughout the peanut-growing area of GEORGIA during the season. Also in Georgia, BEET ARMYWORM (*Spodoptera exigua*) caused light to moderate defoliation of soybeans, peanuts and cowpeas, but was of minor importance on soybeans in ALABAMA during 1964. VELVETBEAN CATERPILLAR (*Anticarsia gemmatalis*) caused light to heavy defoliation of soybeans in GEORGIA, but most of this defoliation ranged light to moderate. SALT-MARSH CATERPILLAR (*Estigmene acrea*) caused minor damage to soybeans in ALABAMA this season.

GARDEN WEBWORM (*Loxostege similalis*) was heavy on late soybeans in western ILLINOIS during early August, and caused light to heavy damage to soybeans throughout MISSOURI, with the heaviest damage to this crop occurring in the southwestern and west central areas of the State. Infestations of garden webworm were about average in ARKANSAS during 1964, with a few spot infestations in soybeans and cotton requiring treatment.

LESSER CORNSTALK BORER (Elasmopalpus lignosellus) populations became damaging to peanuts in OKLAHOMA during August, with counts as high as one larva per plant being noted in Caddo County. This species was the principal pest of peanuts in TEXAS for the third consecutive year, but infestations on peanuts in GEORGIA were generally light to moderate during the 1964 season.

RED-NECKED PEANUTWORM (Stegasta bosqueella) ranged light to moderate on peanuts in GEORGIA, and infested peanuts in OKLAHOMA from mid-July to early October, with many fields showing some damage on 100 percent of terminals. Damage to terminal growth of peanuts in the Portales area of Roosevelt County, NEW MEXICO, became evident during September and October, and was probably due to red-necked peanutworm, which was reported from the State for the first time during the 1963 season.

BEAN LEAF BEETLE (Cerotoma trifurcata) infested soybeans in ILLINOIS during the 1964 season and, in combination with other insects, caused foliar damage to this crop in the northern three-fourths of the State. An estimated 17,078 acres were treated for control this season in Illinois. Bean leaf beetle stripped approximately 25 percent of the foliage from young soybean plants 4 to 8 inches high in marginal rows of many fields over MISSOURI. High counts per linear foot on young soybeans were 5 in the southeast, 3 in the north central and 2 in the southwest, west central and northwest areas of the State. Adults of this leaf beetle caused some leaf feeding damage to soybeans in NEBRASKA, and the pest was present on this crop in OKLAHOMA during the season but caused little damage. Bean leaf beetle infestations on soybeans in ARKANSAS were much lighter during 1964 than usual. This chrysomelid was a minor pest of soybeans in ALABAMA this past year, but did cause light to heavy defoliation of this host plant in GEORGIA; however, most of this defoliation ranged light to moderate in the State.

SOUTHERN CORN ROOTWORM (Diabrotica undecimpunctata howardi) populations in peanuts in the northeastern growing area of NORTH CAROLINA were the lowest they have been since the 1960 season. Southern corn rootworm was a problem to some peanut growers in southwest GEORGIA this season, where one field in Stewart County was completely destroyed.

A COLASPIS (Colaspis sp.) was observed on soybeans in MISSOURI and normal, noneconomic numbers of adults occurred on soybeans, as well as cotton, in ARKANSAS during the 1964 season.

MEXICAN BEAN BEETLE (Epilachna varivestis) caused light to moderate defoliation of soybeans in GEORGIA and was of some minor importance on soybeans in ALABAMA during the season. This plant-feeding coccinellid caused some severe injury to a field of soybeans west of Wathena in Doniphan County, KANSAS, in June, but no injury was found in this same field in the fall of the year.

JAPANESE BEETLE (Popillia japonica) adults began appearing as scattered, light infestations by mid-June in INDIANA. Although many of these infestations were of local concern to homeowners, agricultural damage was restricted to a limited infestation in Newton County in the northwest section of the State. On 6 selected farms in this area, adults of this scarab averaged 58 per 100 feet of row on soybeans, with peak activity apparently being reached by the end of July. Several species of weevils, mainly CLOVER ROOT CURCULIO (Sitona hispidula), damaged severalfields of soybeans following clover in ILLINOIS in June. An estimated 1,020 acres of soybeans were treated in Illinois this year for the control of these pests.

BLACK BLISTER BEETLE (Epicauta pennsylvanica) and a STRIPED BLISTER BEETLE (Epicauta sp.) were moderate on soybeans in areas of VIRGINIA where they occurred during the 1964 season. Populations of black blister beetle, MARGINED BLISTER BEETLE (E. pestifera), ASH-GRAY BLISTER BEETLE (E. fabricii) and Epicauta sp.

were low on soybeans in ILLINOIS. Unspecified BLISTER BEETLES were noted on soybeans in MISSOURI, and Epicauta sp. was present on this legume in OKLAHOMA but caused little damage.

POTATO LEAFHOPPER (Empoasca fabae) infested soybeans and alfalfa in DELAWARE during early July, but was considerably more numerous on these and other crops during late July and August. Counts of potato leafhopper in the southeastern sections of MISSOURI on September 5 ranged 1-5 per leaf in some fields of soybeans and caused severe leaf curling. THREE-CORNERED ALFALFA HOPPER (Spissistilus festinus) populations averaged approximately 10 nymphs per 3 feet of row on soybeans in northwestern LOUISIANA during August.

SOUTHERN GREEN STINK BUG (Nezara viridula) and Euschistus spp. were unusually scarce on soybeans in LOUISIANA this year and only a few heavy populations were found in untreated fields late in the season. Several species of STINK BUGS caused much feeding damage to soybeans in southwestern and southeastern MISSOURI. Banasa sordida, collected from soybeans in Boone County on August 6, 1964, constituted a new State record for Missouri. Also in Missouri, two ALYDID BUGS (Alydus pilosulus and A. eurinus) were observed on soybeans during the 1964 season.

A THRIPS (Sericothrips variabilis) was very heavy on young soybeans in many areas of DELAWARE during late May and throughout June, but populations were generally much lower for the remainder of the 1964 season on this crop. During late June and July, unspecified thrips infested seedling and young soybeans generally in MARYLAND, resulting in widespread streaking and some stunting of plants in all sections of the State. Thrips heavily infested soybeans in various sections of VIRGINIA this season. Infestations of unspecified thrips ranged light to heavy on peanuts in GEORGIA and heavy populations damaged peanuts in the southern peanut-growing area of OKLAHOMA this season.

STRAWBERRY SPIDER MITE (Tetranychus atlanticus) was rather common on soybeans in Sussex County, DELAWARE, during mid-July, and by early August, populations were abundant on this crop in Kent and Sussex Counties. Numbers continued to increase rapidly on soybeans in many areas of the State through the remainder of the 1964 season, causing noticeable injury to a large number of fields. Unspecified SPIDER MITES damaged foliage of peanut plants in several fields near Portales in Roosevelt County, NEW MEXICO, during September. These pests caused foliage to turn brown and shed, leaving only the stalks. Unspecified MITES caused russetting of soybeans in southern ILLINOIS, but no treatments were applied.

LAWN, PASTURE AND RANGELAND INSECTS

Highlights:

ARMYWORM and FALL ARMYWORM outbreaks in eastern Texas caused considerable damage to native and improved pastures, as well as lawn grasses in this area and in several other States to the east and north. SOD WEBWORMS were again a problem in lawns and grasses in several areas of the Nation. SAGEBRUSH DEFOLIATOR was serious on rangelands in Nevada, and RHODES-GRASS SCALE was serious in Arizona, New Mexico, Texas and Louisiana. Large populations of HARVESTER ANTS are apparently increasing on rangelands in northern Arizona. A BERMUDA-GRASS MITE (Aceria neocynodonis) was found for the first time in Oklahoma during the 1964 season and was serious on Bermuda grass in Arizona, Nevada and Georgia. BANKS GRASS MITE severely damaged crested wheat grass in Washington and timothy in Nevada.

ARMYWORM (*Pseudaletia unipuncta*) caused widespread damage to native and improved pastures over a large portion of TEXAS during the 1964 season, with heavy damage reported from the north central, central and upper coastal areas of the State. This pest was present in OKLAHOMA this season but caused little damage. Armyworm larvae caused varying degrees of damage to many bromegrass pastures in southeastern KANSAS, where controls were applied to large acreages to prevent injury. Some reed canary grass and timothy seed fields in northwestern MINNESOTA were heavily damaged in July when economic numbers of armyworm larvae were found in lodged barley and wheat. An occasional pasture was also damaged when adjacent to reed canary grass areas, and one isolated field of Sudan grass in Freeborn County, in the southern part of Minnesota, showed an average of 13 larvae per square foot. Second-generation armyworm larvae caused varying degrees of damage to Sudax and other Sudan grasses during late July in OHIO. Damage by the larvae of this noctuid moth was reported from Ashland, Delaware, Fulton, Huron, Knox, Medina, Putnam, Richland, Seneca and Wayne Counties, Ohio.

First armyworm adults in DELAWARE were collected in a blacklight trap on May 5 in Sussex County. Larvae caused considerable injury to pastures in eastern Sussex County during early July and were even present on alfalfa in several areas of the State during July and August when adult flights were rather heavy. Armyworm infested hay fields and other crops in several parts of PENNSYLVANIA during July, with fall armyworm (*Spodoptera frugiperda*) also being numerous at the same time. Armyworm outbreaks occurred in a number of locations over NEW JERSEY during the 1964 season. A serious outbreak of armyworm occurred during June and July when 20 counties in a belt across the center of NEW YORK were seriously infested. Larval counts ranged up to 30 per square foot in oats. This was the worst infestation of armyworm in New York since 1954, and many fields treated too late or not at all suffered serious losses. Oats, wheat and grasses were damaged in about that order.

Armyworm built up to destructive proportions in VERMONT this year, the last similar outbreak in the State occurring in 1954. Not all fields in any given area of the State were infested, but damage in some infested pastures and hay crops amounted to 100 percent. Activity of the pest subsided in Vermont by August 5. Outbreak numbers of armyworm also occurred at widely scattered locations over NEW HAMPSHIRE in 1964, with light trap collections during late summer yielding high numbers of moths. Armyworm was a general problem throughout MAINE in late July and early August. Heavy larval populations in York County damaged pasture grasses, corn and even some alfalfa in Berwick, Springvale, Sanford, Alfred, Saco, Kennebunk and Lebanon, and heavy damage was inflicted in hay fields in Gorham and several other locations in Cumberland County. The larval population at Gorham was attacked by an undetermined parasite in late July and wilt disease was also suspected to be present. Heavy larval numbers caused severe damage to forage throughout the Knox-Lincoln County area. Heavy populations and damage were reported in hay fields in Lincolnville, Northport and Waldo in Waldo County, with the same conditions existing in Auburn, Lisbon, Minot and Sabattus in Androscoggin and Sagadahoc Counties, Maine. Light to heavy populations and damage occurred in Franklin County. In Washington County, Maine, the easternmost county in the Nation, severe populations of and damage by armyworm larvae were reported from Meddybemps, Cooper and surrounding towns. Light infestations and damage by this pest were reported in coastal areas of the State near Jonesport and Machias.

FALL ARMYWORM (*Spodoptera frugiperda*) became active on grain sorghum in OKLAHOMA and infestations increased until heavy populations were damaging a wide variety of crops throughout the State, including pastures, Bermuda grass and ryegrass. The pest continued active in the State until late November. The outbreak of fall armyworm that occurred in TEXAS during the 1964 season was comparable with those of 1960, 1962 and 1963. Damage to pasture grasses and lawns, as well as other crops, occurred throughout the eastern portion of the State. Heavy infestations of fall armyworm developed on Sudan grass and other grasses during and after August throughout southern and central parts of LOUISIANA. Infestations were common in lawns in the southern half of the State in September and caused considerable injury. In FLORIDA, larvae of this noctuid moth were heavy on Bahia grass and Bermuda grass in the Jackson County area and important on grasses throughout the State this season. Infestations of fall armyworm ranged moderate to heavy on lawn grasses and a number of other crops from southern to northern areas of GEORGIA in 1964. Infestations were quite heavy and more severe than in recent years, being general on Bermuda grass and lawns. Fall armyworm damaged Bermuda grass pastures and lawns in NORTH CAROLINA in many areas of the Coastal Plain the latter part of August. In Harnett County, 100 acres of Coastal Bermuda grass ready to cut for hay were heavily damaged, with larvae averaging 4.5 per square foot in an untreated portion of this field.

Several species of CUTWORMS, especially RED-BACKED CUTWORM (Euxoa ochrogaster) and BLACK CUTWORM (Agrotis ipsilon), required widespread treatment in hay fields in ALASKA as they cut off new stands of oats and peas. This was the first real outbreak of these pests in Alaska for the past 5 years. Unspecified cutworms were more abundant on turf in OHIO than during 1963, but were not present in extremely destructive numbers. A GRASSWORM (Mocis sp.) caused significant damage to Para and Pangola grass pastures at Canal Point and Belle Glade in Palm Beach County, FLORIDA.

SOD WEBWORMS (Crambus spp.) ranged medium to severe on grasses and lawns throughout VIRGINIA during the 1964 season. Adults of Crambus sp. were especially abundant about lights in RHODE ISLAND in early July and late September. In NEW YORK, sod webworms were more abundant and damaging than usual during the past summer in the southeastern area, on Long Island and in the southern tier of counties. Crambus trisectus was more abundant on turf in OHIO than in 1963, but was not present in extremely destructive numbers. C. trisectus and C. mutabilis, but principally C. trisectus, were abundant in turf areas throughout INDIANA for the third consecutive year, with control measures necessary to prevent serious damage. In WASHINGTON, lawns in Whitman County were damaged by C. bonifatellus late in April.

Larvae of a GELECHIID MOTH (Chionodes psiloptera) were abundant on grasses raised for seed near Rockford, WASHINGTON, during December. This is the first record of infestations by this species this far south in Spokane County.

SAGEBRUSH DEFOLIATOR (Aroga websteri) populations were heavy in NEVADA during the 1964 season, although below 1963 levels. Infestations ranged medium to heavy in many northern and central counties, with noticeable damage occurring as far south in the State as Ormsby and central Nye Counties. A LEAF ROLLER MOTH (Synnoma lynosyrana) developed heavy larval populations on rabbitbrush in Lincoln County, Nevada, and was more noticeable than normal in several other counties in the State this past season.

JAPANESE BEETLE (Popillia japonica) was relatively unimportant in CONNECTICUT during 1964, and larval numbers in NEW YORK were at a very low level with very few requests concerning control recommendations. Grub infestations of this scarab ranged light to heavy in grasses in VIRGINIA, but were less abundant in turf in OHIO than they were in 1962. Surveys of selected turf areas and at major airports in WASHINGTON remained negative for this beetle during the 1964 season. Larvae of EUROPEAN CHAFER (Amphimallon majalis) were troublesome in NEW YORK in infested areas where no treatments were applied and the pest continued to spread into uninfested areas, particularly in the Elmira area of Chemung County. NORTHERN MASKED CHAFER (Cyclocephala borealis) was less abundant in turf in OHIO than it was in 1962.

Larvae of MAY BEETLES (Phyllophaga spp.) were more common in OHIO during 1964 than any other turf pest, and adults emerged in large numbers from grassy areas in many counties of the Lower Peninsula of MICHIGAN during the week of May 29. Adults of Phyllophaga spp. appeared in unusually high numbers during the 1964 season in WISCONSIN, with P. rugosa the dominant species in Dane County and

P. fusca also being very common. Larval populations of P. anxia caused some injury to a few wetland hay meadows in Cherry County, NEBRASKA, this season. In NEW MEXICO, pupation of P. koehleriana began about the last two weeks of May and adults were emerging in extremely large numbers in rangeland areas south of Raton, Colfax County, the second week of June. This May beetle appears to have a 3-year cycle, and larvae severely damaged grasses in this area during the 1964 season.

Heavy larval infestations of a BILLBUG (Sphenophorus phoeniciensis) resulted in spotted damage to lawns during late spring in central and western areas of ARIZONA, and S. cicatristriatus severely damaged lawns in the Pasco area of Benton County, WASHINGTON, during the summer of 1964.

HAIRY CHINCH BUG (Blissus leucopterus hirtus) populations were heavy in MAINE where moderate damage occurred to lawns in Augusta, Kennebec County, and in Kittery, York County, during the period August 10-17. This lygaeid bug appeared to be lighter than usual in NEW YORK early in the 1964 season. Although this pest is known to occur over most of the State, it has rarely been reported in damaging numbers. In 1964, however, damaging numbers were reported in the Utica area of Oneida County and from Old Forge in Herkimer County in the region of the Adironack Mountains. The second generation of hairy chinch bug was more abundant on turf in OHIO than was the first generation.

CHINCH BUG (Blissus spp.) infestations during 1964 in CONNECTICUT showed a marked increase over those of 1963, and these pests caused some damage to grass and birdsfoot trefoil in southeast PENNSYLVANIA during early July. Second-generation chinch bug nymphs were abundant and damaged Sudax and Sudan grass in ILLINOIS during August, and infestations in lawns in southwest ARKANSAS were heavier during the 1964 season than in past years. A CHINCH BUG (Blissus leucopterus ssp.) was severe on St. Augustine grass in many areas of LOUISIANA during the year. Large numbers of FALSE CHINCH BUG (Nysius ericae) infested a field of Russian wild ryegrass in Crowley County, COLORADO, this season.

MEADOW PLANT BUG (Leptopterna dolabratus) was heavy in most grass fields in ILLINOIS during the 1964 season, and a PLANT BUG (Amblytylus nasutus) was collected from grass on May 25 near Fisher, Champaign County, for a new Illinois record; populations up to 78 per sweep were present at this time. A GRASS PLANT BUG (Thyrillus pacificus) caused severe damage to portions of fields of intermediate wheatgrass in southeastern WASHINGTON during the early summer.

RHODES-GRASS SCALE (Antonina graminis) was very damaging to zoysia and Bermuda grass in most areas of central and southern ARIZONA during 1964, and was a serious problem on Bermuda grass lawns, especially Tef-green variety, in the Las Cruces area of Dona Ana County, NEW MEXICO, where control was extremely difficult. This mealybug damaged St. Augustine grass lawns in southern TEXAS, and infestations in East Baton Rouge and Assumption Parishes, LOUISIANA, have reached damaging proportions. An ARMORED SCALE (Odonaspis ruthae) damaged Bermuda grass pastures in local areas in the eastern portion of TEXAS this season.

A SPITTLEBUG (Prosapia bicincta) was general on Bermuda grass in central and southern areas of GEORGIA during the 1964 season, with feeding causing the browning of many pastures. This spittlebug was spotty in FLORIDA, but two pastures in the Belle Glade area were noticeably affected during July. In the area north of Tampa south to Ona, damage by this pest was rather severe at isolated locations, but generally not so bad as in previous years. Pangola grass and Pensacola Bahia grass were among the affected hosts.

YELLOW SUGARCANE APHID (Sipha flava) caused some damage in FLORIDA during the 1964 season in the Everglades and on sandlands, but due to dry weather injury was probably worse on sandlands. Damage by this aphid was particularly severe on pastures near Lake Worth and Boynton Beach, Palm Beach County. In the Everglades, damage was more spotty, but during March and April, some pastures showed considerable discoloration and some ranchers applied controls.

ENGLISH GRAIN APHID (Macrosiphum avenae) and Rhopalosiphum padi were heavy on ryegrass cover crops in the Puyallup Valley of WASHINGTON during the spring of 1964. In UTAH, Aphis bonnevillensis was less numerous in Millard County and northern range areas than during the two previous seasons, but A. heraclella was numerous on cow-parsnip foliage in northern canyons of Utah during the season.

Larvae of GRASS SAWFLIES (Dolerus unicolor, D. collaris and D. nitens) were abundant in forage fields throughout northwest OHIO during the 1964 season, with larval counts of Dolerus spp. ranging 2-3 per sweep being noted in Medina County. TEXAS LEAF-CUTTING ANT (Atta texana) caused considerable concern in southern and southeastern areas of TEXAS this year. Large populations of HARVESTER ANTS (Pogonomyrmex spp.) appear to be increasing on rangeland in the northern portion of ARIZONA, where mound counts as high as 150 per acre were noted during 1964. In CALIFORNIA, FIELD CRICKETS (Gryllus spp.) infested pastures and fields at a few locations during the 1964 season.

A BERMUDA-GRASS MITE (Aceria neocynodonis) occurred on Bermuda grass in several locations within CALIFORNIA during the season. This eriophyid mite seriously damaged many Bermuda grass lawns in Maricopa, Pinal and Pima Counties, ARIZONA, during the summer months, and populations varied from light to heavy on lawns and damaged Bermuda grass pastures in Clark County, NEVADA. This species was found for the first time in OKLAHOMA during the 1964 season, where it caused severe damage to Bermuda grass lawns in Oklahoma City during mid-June. This eriophyid is now known to occur in Oklahoma, Jackson and Woods Counties in that State. Aceria neocynodonis also caused some damage to Bermuda grass in GEORGIA this year. Another ERIOPHYID MITE (Aculus dubius) was prevalent in timothy fields in the Kingston area of Washington County, RHODE ISLAND, for the third successive year.

BANKS GRASS MITE (Oligonychus pratensis) severely damaged crested wheatgrass early in the summer of 1964 in Garfield County, WASHINGTON, and damage to timothy in Lyon County, NEVADA, was severe for the second consecutive year. Scattered, heavy populations of SPIDER MITES (Tetranychus spp.) damaged Bermuda grass seed in Yuma County, ARIZONA, during May and June, with peak populations occurring during mid-June.

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